

Beatty
**STABLE
EQUIPMENT**

**BARN
BUILDING
SECTION
No. 1**

**Every Barn and Stable Shown in this Book Has
Beatty Sanitary Steel Stable Equipment**

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THIS Beatty Barn Building Book is published in the interest of better barns. The data has been compiled after years of research and experiment, by experienced architects, engineers, and practical farmers.

All the barns and stables here shown have Beatty labour-saving, sanitary steel stable equipment and are typical of thousands of barns throughout the world which are completely fitted by Beatty.

Write to the nearest Beatty Branch when you desire information. We will gladly help you to lay out your stable and furnish particulars regarding any Beatty merchandise.



BEATTY BROS. LIMITED

Head Office
Fergus, Ont.

Beatty

Established
in 1874

Largest Barn Equipment Manufacturers in the British Empire.

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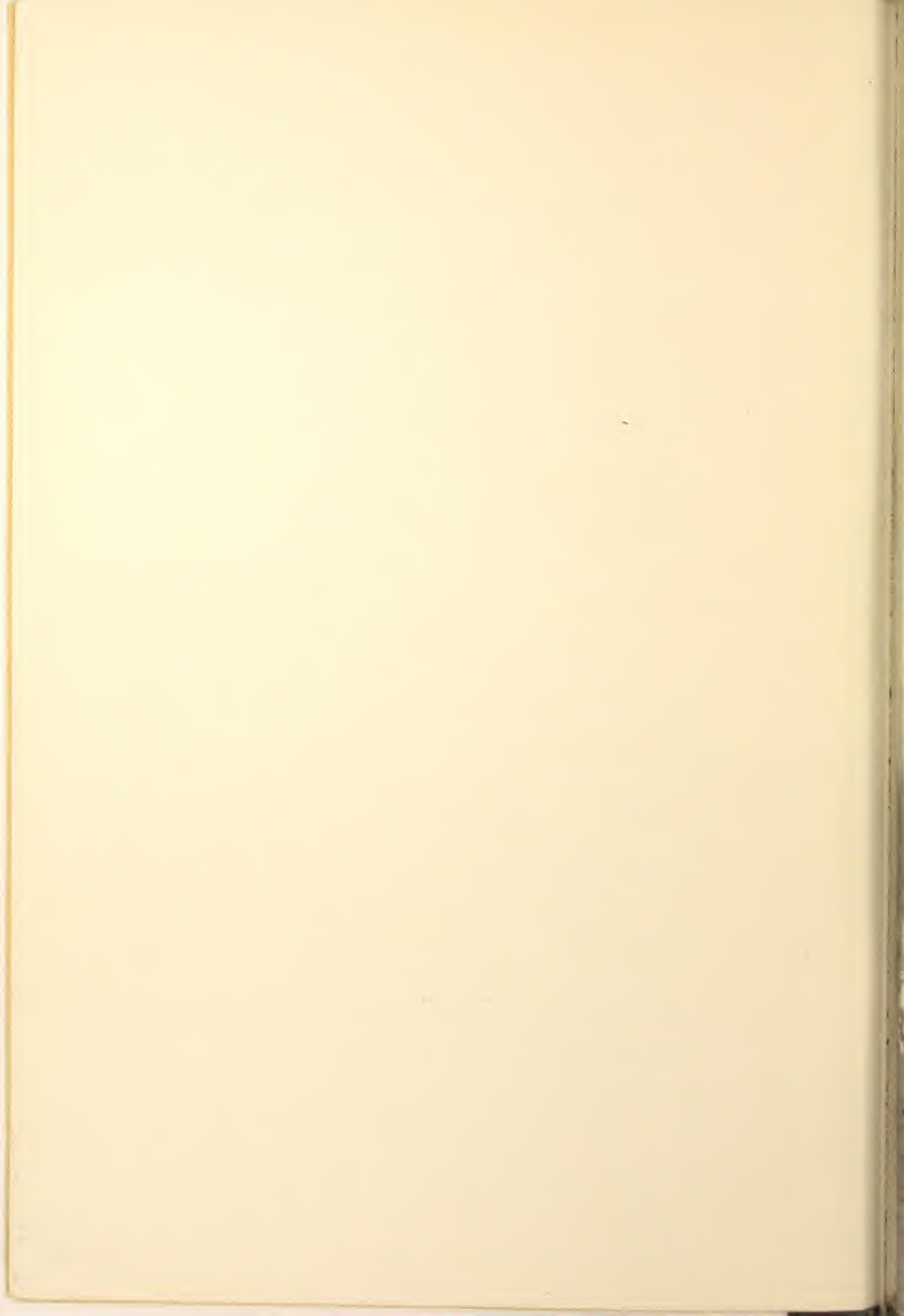
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CANADA — THE HOME OF GOOD BARNs

CANADA'S most important industry is agriculture. This important industry, marching steadily forward, is building up in Canada, high standards of farm production. The excellent results achieved by Canadian farmers have caused other agricultural countries to look to Canada for quality grains, livestock, meat and dairy products, and to adopt many of Canada's modern methods of farming. Products of Canadian farms make up a large percentage of Canada's great foreign trade.

Barn is Centre of Farm Operations

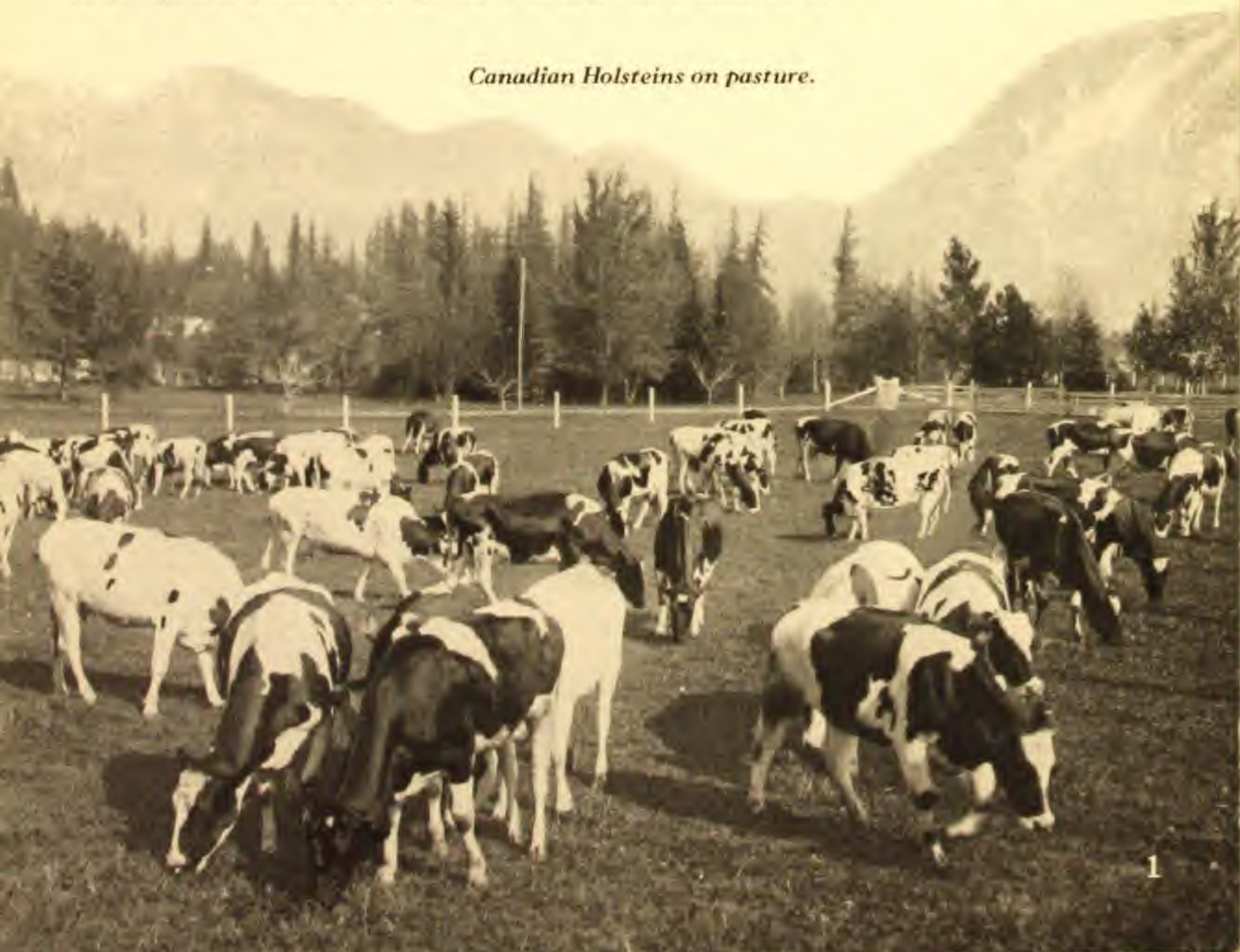
Throughout the livestock area the BARN is the centre of operations and is a vital factor, not only in building up Canada's livestock reputation, but also in the farmer's personal prosperity.

The Canadian climate makes a good barn and stable a necessity; without them profitable production of livestock, beef and dairy products cannot be carried on successfully. This is the main reason why Canada is the home of good barns.

More Money is Made When Stock is Well Stabled

Canadian cattle, especially dairy strains, must be stabled for the greater part of the year. Good health and high milk production through this long period of confinement, are as dependent upon the care exercised in stabling as upon skillful breeding and proper feeding. Income from a productive herd, returns from a fertile farm well worked to supply feed, and skill in using feed to the best advantage—all of these cannot be fully realized and may be seriously curtailed, if the buildings in which the animals are stabled for so many months of the year are not well planned, sanitary and comfortable.

Canadian Holsteins on pasture.



Important Features of the Stable Are Inside

The modern, well-built stable of today provides as much light and is as well ventilated as the most up-to-date office building. Cows are tied in comfort and are kept clean. The work is made easy through the use of steel stalls, stanchions, water bowls, manure carriers and other modern steel stable equipment designed to save both time and labor. The modern barn is a credit to the owner and a pleasure to work in. It has met with such wide favor that older barns have been remodelled by the hundreds, so that modern layout and equipment could be incorporated in them.

Steady progress towards better breeding and higher production is the aim of farmers who specialize in breeding live stock. For this reason, it is vitally important to retain on the farms, reliable and experienced hired help. This is being accomplished through farm mechanization, and the use of modern, labor-saving steel stable equipment. New and remodelled barns are being planned and equipped to save needless steps in feeding and caring for the herd. Labor-saving barn equipment is enabling the farmer to meet the problem of higher wages by reducing the number of hired help, and keeping good help satisfied.

Leadership and Progress

Progressive farmers, dairymen and breeders everywhere are giving splendid leadership in the movement toward better-planned and better-equipped barns. Outstanding barns, fitted with the latest labor-saving equipment, can be found in every district.

Dominion and Provincial governments, agricultural colleges, churches and other organizations are setting a good example of progress, improvement and modernizing by building new barns or remodelling old barns on experimental and demonstration farms, and fitting them with modern equipment.

Men of means who purchase farms for recreation, build and equip some of the finest barns in the country. They make a hobby of caring for pure bred, high-producing cattle and experiment with many types of farm animals. They experiment for better results with feed, methods of stabling and equipment and

*One of Canada's outstanding
Ayrshire herds.*



are helping to develop the breeds in which they are interested. They are proving the advantages of modern barn construction and of labor-saving, steel stable equipment. Their valuable contribution toward the improvement of livestock and agriculture is a credit to themselves and to the country.

Beatty Bros. Limited acknowledges and appreciates suggestions and help received from farmers and institutions. It has been a privilege to keep in touch with a great many users of Beatty equipment and to observe how well Beatty goods measure up to the high standard of performance required of them. For more than 75 years Beatty engineers and factory workmen have faithfully applied skill and experience to the design and manufacture of time- and labor-saving equipment for the farm. Thousands of customers have approved the utility and quality of Beatty goods and have recommended them to their friends. They include farmers in every township, county and province of Canada. The aim of the company will continue to be to build equipment for barns and stables which will enable farmers to raise healthy cattle and obtain maximum returns from them with the least labor. It is a privilege to be associated, in this most helpful way, with the great livestock and dairy industry.

General Design and Stable Layout

Interest in customers is not limited to the sale of suitable equipment for barns and stables. Helping every farmer to plan his whole stable layout is quite as important. Information will continue to be supplied on the best methods of planning, framing, building the barn and installing modern stable equipment. This is part of the company's service to customers. So, this book begins with a discussion of the essentials of a satisfactory barn, reviewed briefly; then, the different points are presented in detail and illustrated by actual photos and drawings in this building section.

Canadian Jerseys in attractive surroundings.





Home of Mr. H. Selby, Simcoe, Ont.

A FEW OF
CANADA'S
BEAUTIFUL
FARMSTEADS



Home of Mr. E. B. Thompson, R. R. No. 2



"Star Dust Farms" Mr. E. R. Bibby Galt, Ontario



"Leitchcroft" Country home of Mr. G. C. Leitch, Gormley, near Toronto, Ont.



Farmstead of the late Chas. Warty, Maple, near Toronto, Ont.



Abbotsford near Chilliwack, B.C.

WHERE THE
ENVIRONMENT
IS REFRESHING
AND STIMULATING



Country home of Dr. N. F. Schram London, Ont.



Country place of Mr. Hugh Aird, Maple, near Toronto



Farmstead of Mr. W. J. Edgar
Lethbridge, Alta.

ATTRACTIVE TYPES
OF COUNTRY HOMES



Green Pines Farm
Estate of



Home and Barn of Geo. Hoar & Son, Moncton, N. B.



Home and dairy buildings of Mr. G. Muys Winnipeg, Man.



Farm Buildings of J. Grauer & Sons Ltd., Eburne, near Vancouver, B.C.



Geo. C. Hendrie
near Hamilton

ENHANCING THE
CHARM OF
RURAL CANADA



Country Estate of Mr. J. L. Dion, Sweetsburg, Que.



Buildings of J. Frank Wilson & Son, Hagersville, Ont.

The first section deals with general design, including framing of barns, hog houses, horse stables, milk houses, manure and implement sheds. Practical and economical ground floor layouts, ventilation, doors, windows, walls, floors and stable drainage are shown. Proper measurements and locations for cattle stands, curbs, gutters, mangers, cattle walks, passages, box stalls and pens are also given.

By constant study of hundreds of barns, and close association with the best authorities in Canada, a number of excellent standard layouts, which any farmer can adapt to suit his particular needs, have been arrived at. The best methods of building the superstructure and walls, laying floors, arranging ventilation and lighting the stable have been outlined, and the best method of tying and caring for stock suggested.

The Modern Barn

In the front of the book are shown photos of recently-built Canadian barns, which for handsome appearance are unsurpassed anywhere. These show Canadian readers and those of other lands what Canadian farmers are doing. Throughout the book will be found many illustrations of less ornate buildings which will appeal to the average farmer.

There is no direct connection between the cost of the barn and its effectiveness. In order to be well built, a barn does not have to be costly. The economical results other experienced farmers have secured and which are shown in the following pages, were obtained by study of practical designs and the application of sound principles of economy in planning and construction.

One of the Dominion's fine Guernsey herds.



So far as equipment is concerned, the farmer who buys Beatty standard equipment gets the same materials and workmanship as supplied for the costliest barns in the land. Any farmer who builds his stable according to the plans, illustrations and detailed information provided, has a stable equal in comfort and efficiency that compares favorably in appearance with any shown in this book.

Satisfied Customers Tell Others

The increasing importance and appreciation of well-planned steel-equipped, sanitary stables, the excellent service given by Beatty fittings in thousands of barns and the word-of-mouth recommendations of thousands of satisfied users have created a demand for Beatty equipment greater than ever known before. The photographs throughout the book serve to show that the demand comes not only from every province of Canada, but from many agricultural countries of the world. Every barn shown herein has Beatty Sanitary Steel Stable Equipment.

*Canadian Shorthorns
beside a brook.*



A FEW CANADIAN

BARNs

OF

DISTINCTION



Barn of the late Mr. A. Little, London Ont.



Eaton Hall Farm



Rebuilt in 1937, North view



South view

Barns at Eaton Hall Farm, Estate of the late
Sir John Eaton, Eversley, north of Toronto, Ont.

All three Beatty equipped.

CANADA
HOME OF

G
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Barn at "El Rancho Fronsac", country home of
the late Mr. J. D. C. Forsyth, Kitchener, Ont.



Barn of Mr. J. J. E. McCague, Alliston, Ont.



Barn of Mr. G. N. Irwin, Pickering, Ont.



Barn of Don A. de la Farm Limited, Todmorden, near Toronto, Ont.

SOME OF THE WORLD'S FINEST BARN



Doneddy Farm
Pinegrove, Woodbridge, near Toronto



Barns of the late
Mr. N. L. Nathanson Maplecrest Farm view from Road



Farm buildings of the late
Mr. N. L. Nathanson Maplecrest Farm view from Lake



Barns of the late
Mr. N. L. Nathanson Maplecrest Farm Maple, North of Toronto

EXCELLENT EXAMPLES OF CANADIAN BARN ARCHITECTURE



Barn and Herd at Roslyn Park Farm, Galt,
Ont. Geo. Hancock, Owner.



Barn of Mr. F. S. Biggs,
Dundas, Ont.



Barn of Mr. P. F. Law (Law Construction Co., Toronto),
at Weston, Ont.



Barn of Mr. A. H. Fair, Kingston, Ont.



Barn of Fred Colpitts, Salisbury, N. H.



Barn of Mr. A. V. Cook, Waterville, N. S.



Barn of Mr. A. C. Fuller, President of Fuller Brush Co. Berwick, N. S.

SOUNDNESS
OF DESIGN
AGAIN
DEMONSTRATED



Barn of Mr. Chesley Eddy, Clearwater Farm Bathurst, N. B.



Barn of Credit Foncier St. Jean Baptiste de Rouville, Que.



Modern Barn on Hallward Farm, North Hatley, Que.



Barn of Belgian Agricultural Institute of Canada, Oka, Que.

FEATURING
CAPACITY
WITH
ECONOMY



Barn at Mount Victoria Farm,
Country Home of the late T. B. McCauley, Hudson, Que.



Barn of Harry Bose & Sons, Sullivan, near Cloverdale, B.C.



Barn of Mr. A. Wright, Ladner, B.C. (Gold Crest Dairy)



Barn of the late Mr. Percy Lasby, near Moose Jaw, Saskatchewan.



Barn of Brooksbank Laboratories Ltd. where certified milk is produced, Eburne, B.C.



Farm buildings at Bellavista Farms, Milner, B.C.



Barns of the Alberta Mental Hospital, Ponoka, Alta.



Barn of Mr. John R. Peers, Sumas Prairie, near Chilliwack, B.C.



Barn of Mr. S. W. Randall, Ascot Farm, Steveston, B.C.

WHERE BALANCE AND BEAUTY MEET---

The Essentials of a Satisfactory Barn

Man has taken a long time to learn how to stable livestock to make a profit in winter, as he does in summer. Various shelters, used at different periods, have developed into what can now be said with reasonable certainty to have the essentials of a satisfactory barn. The principles incorporated have been given thorough tests in actual use. Many farmers have built barns along lines recommended as a result of these tests, have succeeded in handling livestock and have made money.

Economy of Construction

Whether \$2,000 or \$10,000 is spent on a barn or a group of farm buildings, the farmer should get value for every dollar of first cost, but, more important, value through low-cost operation and greater returns over a lifetime of use. Economy in construction and low-cost operation will depend largely on forethought and care in planning.

Warmth

On account of cold winters, farmers realize it pays to build for warmth. They know that a great part of the feed goes to produce body heat and waste of body heat means serious waste of feed. Tests show that it takes more feed to produce a given amount of milk when the temperature in the stable is 32 degrees than when the temperature is 55 degrees.

In separate hog barns, dry warmth is so essential to the growth of hogs, that greatest care must be exercised to prevent loss of natural body heat.

Warmth demands that consideration be given to the size of the building. The inside dimensions and ceiling height should be in correct proportion to the number of animals to be stabled. This will ensure sufficient cubic feet of air space per head of stock. Well constructed stable floors, walls and ceilings will conserve heat, save feed, and help to make a profit.

A slightly lower temperature is satisfactory in steer feeding and horse barns than in cow, calf and hog barns.

Dryness

Dampness is a serious detriment in any stable. It makes animals delicate, breeds disease, creates offensive odors which contaminate milk and it makes the stable unpleasant for the farmer. Excessive moisture destroys implements, rots harness and depreciates buildings.

Aberdeen Angus and a typical Canadian background.



A proper ventilating system, with walls and ceiling built to prevent condensation, will keep the stable reasonably dry. In hog barns, brooder stoves or jacket heaters are successfully used to provide additional warmth and to dry the air. Dryness is one of the most important essentials.

Sunshine

When building a new or remodelling an old barn, it costs little to take full advantage of sunshine. A few extra or larger windows will allow sunlight to flood the stable to its remotest corners. In a stable flooded with sunlight, parasites, such as lice, ringworm and other pests, are more easily controlled. Abundance of sunshine promotes health, stimulates growth, helps to warm the stable, dry the air, shorten the hours when artificial light is necessary and makes the stable work more pleasant. By all means, ensure plenty of sunshine by having well arranged windows.

Because sunlight is strongest from the South and West throughout the Canadian winter, place the barn, when possible, with the ends to the East and West. This will provide for a row of windows on one long side and across one end, to take full advantage of the South and West sun. When possible, it is good practice to have the approach to the barn, the root cellar, silos and feed rooms on the North side of the barn where they will shelter the stable and will not obstruct sunlight. This places the barn yard in the warm South or South-West.

When horses are to be housed in the same stable as cattle, they are usually located in the East end, so the cattle can have full advantage of the West as well as the South sun. If no room is required for horses, feed rooms and silos may be placed at the East end of the barn.

Fresh Air

Every day, animals are given large quantities of feed, to turn into milk and meat products. Production is often pushed to the limit. This continuous forcing can only be carried on profitably when the animals are kept healthy and vigorous. In maintaining health and vigor, fresh air is vitally important.

Nature gave farm animals big nostrils and lungs of large capacity. They are intended to inhale large volumes of fresh air. Their health and vitality demand it. Fresh air should be available to them at all times by means of a good ventilation system.

Animals will not develop as rapidly, nor reach their highest production, in poorly ventilated stables where the air is foul, often

BARN

ESSENTIALS

Herefords on Western Canada plains.



laden with moisture and disease germs and drained of vital life-giving oxygen. In such stables, the result will be delicate animals, susceptible to disease.

A good ventilation system will air-condition the stable. It will control temperatures and prevent unnecessary heat loss. It will control humidity and prevent ceiling rot. It will eliminate stable odors and promote health and comfort. Ventilation will greatly help to raise the animals' vitality to the highest point, so necessary in achieving greater production.

Ventilation cannot be left to the chance opening of drafty doors or windows. It should be regulated by means of fresh air inlets well located in the outer walls of the stable. A steady inflow of fresh air should be offset by a steady outflow of foul air, so the animals will receive sufficient quantities of oxygen vitally needed to turn feed into heat, milk and meat. Fresh air is free. It pays to take advantage of it.

Foul air outlet shafts of adequate size or exhaust fans should be suitably placed to allow the free passage of foul air out of the stable. Fans are sometimes used to bring fresh air into the stable. A suitable ventilation system properly operated will soon pay for itself. (See pages 99 to 107 for systems of ventilation).

Animal Comfort

Animal husbandry has a strong appeal to mankind. For some men it is an interest, a hobby, an outlet for their love of animals. But its primary purpose, all through the ages, has been to provide food and enable the owner to make a profit.

The supreme achievement of animal husbandry is the modern dairy cow, recognized as the foster mother of the human race. The dairy cow, through selective breeding and careful feeding, has been developed into a high producer of humanity's most vital food.

This development, during which one milk record after another has been broken, has made the cow practically a producing machine, sensitive and quick to respond to careful handling and comfort by better performance. It is profitable to keep a cow comfortable and contented. Dairy men prove by actual records that comfortable cows give more milk. Beef cattle, hogs, horses and other farm animals respond to comfort as readily as dairy cows, though this response may not be as apparent. It will pay well to make sure the new barn and stable provides every modern means for maximum comfort of livestock.

Cleanliness

A cow cannot be comfortable unless she is clean. She cannot be at the peak of health and production and be dirty at the same time. It is unreasonable to expect her to produce a clean, high class product unless she is kept clean and lives in clean surroundings.

Nowadays, with the help of modern steel stable equipment, it is easy to keep cows clean. A clean herd and stable is a credit to the owner. Clean cows please the dairy inspector, but more important, a clean herd and stable make possible the production of safe, wholesome milk and other dairy foods. A clean product demands the highest market price and provides the greatest margin of profit.

An interesting Canadian barnyard scene.



Labor Saving

The most satisfactory and profitable barn and stable is one planned, built and equipped to save time and labor. Saving steps in feeding, bedding, milking and cleaning will shorten and lighten the daily round of stable chores.

Labor-saving steel equipment brightens the stable and makes the work easier for everyone. Steel stanchions are more easily tied and untied than chains. Steel stanchions and aligning devices keep the cows clean and save labor. The open steel partitions speed up and make easier the work of cleaning, bedding and milking. The owner, his family and hired help are more contented and happy working in a bright, steel-equipped stable fitted with time and labor-saving equipment.

Location and Grouping

In most of Canada (except those districts devoted to grain farming), advanced methods of livestock-raising now call for a group of farm buildings such as a barn and stable, a dairy, separate hog house, poultry house and implement shed. Often a separate horse stable, a sheep shed and a manure shed are desirable. The planning of the new barn should take into account its location in relation to other farm buildings, present and future.

Points to keep in mind when choosing a site for one or a group of farm buildings are, saving of steps in doing the work, taking the best advantage of sunshine, providing high ground for good drainage and a central location convenient to lanes and fields.

Provide a clean, warm, dry, sunny barn yard. By all means consider good appearance and arrange all buildings as compactly as feasible, having in mind fire hazard.

Appearance

A well arranged, fine appearing group of farm buildings is evidence of forethought in planning and usually indicates good management, industry, thrift, economy and success. When properly arranged and designed, nothing can give more pride or pleasure to the owner or add more to the value of the farm.

The modern, new barns and other buildings illustrated in this book, while planned along straight, simple lines to economize in materials, were carefully designed to give a pleasing outside appearance. This can be achieved with standard materials, mainly through correct proportion, proper roof pitches, balance, and well chosen, carefully spaced doors and windows.

Build On Paper First

Good appearance is more the result of wise planning, well in advance of the actual building operation, than of added cost. Wise planning usually makes the barn look better and cost less.

The barn can be made fine looking and at the same time kept well within the budget of the average farmer. For example, a good type of roof ventilator will add much to the attractiveness of a building at little extra cost. One or two dormer windows on the roof enhance the appearance and at the same time are useful for light and ventilation. A cornice adds improvement at low cost and a coat of paint saves the surface. Fine appearance has its own cash value. The owner and his farm are judged largely by the appearance of the farm buildings.

Forethought

Forethought and careful planning in advance are the first steps toward a better barn. Care and good judgment in selecting reliable materials and equipment of good quality are very important. Proper blueprint plans for the guidance of the builder will avoid costly mistakes, waste of time and materials.

This book and Beatty barn engineering service will help a builder to produce a practical, economical, serviceable and profitable barn or group of farm buildings.

FARM
BARNs
OF
CANADIAN
COLLEGES
SCHOOLS
INSTITUTIONS



Barn of Monastery of Mount Carmel, Niagara Falls, Ont.



Barn at the Indian Residential School, Kamloops, B.C.



Barn at St. Peter's College, Muenster, Sask.



St. Louis Farm, Grey Nuns of the Cross, Ottawa.



Farm of the Trappistes Fathers at Oka, Que.



Barn of the Sisters of St. Joseph, Richmond Hill, Ont.

FARM
BARNs OF
CANADIAN
COLLEGES
SCHOOLS
INSTITUTIONS



Barn of Oshawa Missionary College, Oshawa, Ont.



Barn at Prince of Wales Fairbridge Farm School, near Duncan, B.C.



Barn of University of Saskatchewan, Saskatoon, Sask.



Barn of University of Alberta, Edmonton, Alta.



Barn at the Farm of University of British Columbia, Vancouver, B.C.



Barns at the School of Agriculture, Ste. Anne de la Pocatière, Que.



Barn of the Sisters of the Good Shepherd, Cap Rouge, Que.



Barn at Dominion Experimental Station,
Morden, Man.



Barn at Central Experimental Farm,
Ottawa.



Macdonald College Barns, Ste. Anne de Bellevue, Que.



Barn at Dominion Experimental Station,
Beaver Lodge, (Peace River Block,) Alta.



Barn at Dominion Experimental Farm,
Agassiz, B.C.



Dairy Barn, O. A. C. - Guelph, Ont.



Long Barn, O. A. C. - Guelph, Ont.



Test and Calf Barn, O. A. C. - Guelph, Ont.



**Old People's Home Barn
Stellarton, (Pictou County) N.S.**



**Old People's Home Barn
Strathroy, Ont. (Middlesex County)**



Old People's Home Barn Kitchener, Ont. (Waterloo County)

The Size of the Barn

When planning a new barn, the size of the farm, the type and method of farming, the space required for crop storage, the number and kind of animals to be stabled, all should be taken into account in deciding the ground floor area and storage capacity of the barn.

Farmers specializing in mixed farming, dairying, feeding for meat, breeding and raising livestock, or a combination of any of these, will find that the number of animals to be stabled, in most layouts, determine the area, or ground floor size of the barn.

The extent of power equipment used, such as a tractor and combine; the custom of harvesting and threshing, whether in the barn or outside; the method of storing hay, loose or in bales; the amount of roots and silage required; all these will have a direct bearing on the space required for the storage of feed. The amount of feed to be stored will, in most cases, determine the type and capacity of barn frame to select.

Points To Be Considered

The size of the farm, the method of farming, the plan to be followed in animal husbandry, will determine the number of animals to be stabled and the number of box stalls. These, with passages and other essential space requirements, will enable the planner to decide the ground floor size of the barn. In planning, provide adequate space having in mind economy of construction.

In addition to the actual space required by the animals, for standing stalls, box stalls and passages, provision should be made for the location of hay and straw chutes, feed room, root cellar, silo chutes, stairs, harness room and any other features necessary in a modern barn and stable.

With the total accommodation in mind, refer to pages 55 to 89 for a wide variety of ground floor stable plans from which to select suitable layout. Pages 37 to 53 illustrate barn frames of different heights and capacities, designed to meet the needs of different methods of farming. With the aid of these plans, scores of farmers have combined a ground floor layout most suitable for their needs with a framing plan of sufficient storage capacity and arranged them to suit their surroundings and individual requirements.

Box Stalls Are Desirable

The tendency in recent years has been to increase the number of box stalls in proportion to the number of tie-up stalls. Individual pens for young calves, group pens for calves and young stock, bull pens and pens for sick or freshening cows are important. The dairyman who raises his own replacements and the experienced breeder are aware of the importance of having sufficient box stall accommodation. Where young stock is bred and raised to maturity, an average of one or two box stalls for every three standing stalls is recommended. In the average dairy or feeding stable, one to every six standing stalls but not less than three to five box stalls should be provided.

Feeding Steers

Some beef men favor tie-up stalls for the economical feeding of steers; others favor loose box stalls. The best results from loose box stall feeding can be obtained through the use of steel pen fronts with built-in stanchions in which loose animals can be tied up and fed individually. The tie-up method, whether in open stalls or loose box stalls using stanchion fronts, ensures every animal his rightful feed portion, and prevents bullying and waste. Plans on page 73 illustrate both methods of feeding.

The Shape of the Barn

The modern, rectangular-shaped barn is popular because it meets the requirements of most farmers. This barn is built 36 ft. to 40 ft. wide. Some are built narrower but widths 36 ft., 38 ft. and 40 ft. are most satisfactory. The length varies according to requirements but is seldom over 120 feet. A barn of this shape is economical to build and can be convenient to work in, bright and sunny throughout, easily ventilated, attractive in appearance and well suited for dairying, mixed farming or feeding.

Barns 36 ft. to 40 ft. in width have room for two long rows of standing stalls with box stalls for cattle across one end and stalls for horses, when required, across the other end. Stalls arranged in two long rows, save time and steps in feeding, milking, cleaning, bedding and caring for the stock. Short rows of stalls across the stable increase the number of steps and amount of time required to do the work and are now considered out-of-date.

When the modern rectangular-shaped barn, properly proportioned, will not meet the need of the farmer, the wide rectangular barn or the L-shaped barn is the next choice. The wide rectangular barn can be built from 46 ft. to 50 ft. wide and will look well in any length up to 120 ft. It will provide two rows of standing stalls and a row of box stalls the full length of the barn. Stalls for horses and a bull pen are usually placed across one end of the wide rectangular barn, preferably in the east end.

The L-shaped barn usually has two rows of standing stalls full length of the main barn. The L-section accommodates horses and pens. When more accommodation is required, the T-shaped or U-shaped barn is recommended. These are actually a combination of rectangular frames of various sizes so constructed in one unit as to provide more capacity and at the same time keep the barn in balance and attractive in appearance.

Steel stable equipment is not as bulky as equipment of other materials and will enable the farmer to accommodate more stock and reduce the size and cost of the barn. Proper arrangement will save steps, time and labor in caring for the stock, and increase profits as long as the barn and stable are in use.

Beatty representatives are experts in barn construction and stable planning. They are continually helping farmers solve barn problems and will gladly help anyone to select the best type of framing and arrange a good stable plan. Greatest economy and largest savings depend on combining correct floor plan, framing and equipment. Prospective builders are invited to take advantage of the Beatty man's services.

Weights — Mow Space — Floor Loads

Hay, baled, weight per cu. ft.	12 lbs.	Mow space	166	cu. ft. per ton
Hay, cut	"	"	200	"
Hay, loose	"	"	500-550	"
Straw, baled	"	"	200	"
Straw, loose	"	"	600-660	"

Average load on barn floor under mow—100 lbs. per sq. ft.

Average load on barn floor under granary—300 lbs. per sq. ft.

To estimate the amount of grain in a bin, take the measurements of length, width and height of the grain in the bin, obtain the total cubic feet of grain and then divide this by $1\frac{1}{4}$ to find the number of bushels in the bin.

BRITISH COLUMBIA BARNNS



Barn of Mr. F. C. Brown, Winfield, B.C.



Barn of Mr. J. S. Bailey, Vernon, B.C.



Barn of Mr. H. Savage, Ladner, B.C.



Barn of Mr. L. Tisman, Chilliwack, B.C.



Barn of Mr. W. J. Park, Pitt Meadows, B.C.

**BARN
OF THE**

**P
R
O
V
I
N
C
E
S**



Barn of Mr. C. E. Nelson, Deroche, B.C.



Barn of Fourteen Mile Ranch Company Limited, Hope, B.C.



Barn of J. Grauer & Sons Ltd., Eburne, near Vancouver, B.C.



Barn of Mr. Charles Schultz, Sullivan Station, B.C.



Barn of Mr. F. B. Elliott, Chemainus, B.C.

SASKATCHEWAN BARNNS



Barn of Mr. P. Howlers, Lang, Sask.



Barn of Mr. Josef Hansen, Wadena, Sask.



Barn of Mr. H. Hinderks, Romance, Sask.



Barn of Mr. P. O. Miller, Saskatoon, Sask.



Barn of Mr. Wm. Lohmann, Pilger, Sask.

MANITOBA BARNs



Barn of Mr. W. R. Conner, Deloraine, Man.



Barn of Mr. J. Bruce Condle, Goodlands, Man.



Barn of Mr. L. Ferris, Holland, Man.



Barn of Mr. P. Hudson, Dugald, Man.



Barn of Mr. E. Gobert & Sons, Flanders Dairy, near Winnipeg, Man.

ALBERTA BARNNS



Barn of Mr. Sam Kostynuk, Smoky Lake, Alta.



Farm Buildings of Mr. J. W. Hosford, Edmonton, Alta.



Barn of Dept. of Health
Oliver Farms, Clover Bar District near Edmonton, Alta.



Farm Buildings of E. I. Clarke & Son, Namas, Alta.



Dairy Barn of Hays Limited, Calgary, Alta.

MARITIME BARNs



Barn of Mr. L. Sutherland, Kensington, P.E.I.



Barn of Connors Brothers Limited,
Black's Harbour, New Brunswick.



Barn of Mr. H. Linkletter, Summerside, P.E.I.



Purdy Jersey Farm, Truro, N.S.



Barn of Mr. Emery Brown, Sussex, N.B.



ONTARIO BARNS



ONTARIO BARNS



Farm Buildings of Dr. F. F. Tisdall, near Toronto.



Llenroc Farms Ltd., Chippawa, Ont.



Barn of B. H. Bull & Son, Brampton, Ont.



Sunnybrook Farm, owned by
Mrs. P. F. Potters, Langton, Ont.



Barn of Hon. H. A. Bruce, M.P. Toronto.



Barn of E. Charette & Fils, Hanmer, Ont.

QUEBEC BARNs



Barn at Dominion Experimental Station
L'Assomption, Que.



Barn of Mr. W. C. Wylie Howick, Que.



Barn of
Mr. W. C. Pitfield Saraguay, Que.



Barn of Reverend Sisters of Charity
Ferme de Foy, Que.



Barn of
Mr. Graham H. Hill Pont Rouge, Que.



Barn of the Christian Brothers Chemin Ste. Foy, Quebec, Que.

QUEBEC BARNs



Barn of
Mr. J. J. Joubert, St. Vincent de Paul, Que.



Barn of Seminary College, Rimouski, Que.



Barn of Mr. J. A. Eccles, Sweetsburg, Quebec



Barn at
Dominion Experimental Sta: Lennoxville, Que.



Barn of Mr. J. R. Ayers, Sweetsburg, Que.



Barn at The Hospital of St.-Michel-Archange, Mastai, Que.

COW HOUSES OF THE BRITISH ISLES



Interior of Cowhouse, Portrane
Mental Hospital, Portrane Co.
Dublin, Irish Free State.



Interior of Cowhouse
of G. Odium Esq.
Manningford Estates



Model Cowhouse and Dairy of
Capt. The Rt. Hon. The Earl of Lisburne,
Crosswood, Cardingshire, Wales



Cow Houses for Sir Herbert Austin, K.B.E.
Yew Tree Farm, Barnt Green, Worcestershire



Beatty Equipped Cowhouse, Basildon
Park, Berkshire, England

COW HOUSES OF MALTA, B.W.INDIES, SOUTH AFRICA AND NEW ZEALAND



Interior view of the Model Cowshed
at the Government Stock Station
Ghammleri, Malta



Waterloo
Barbados, B.W.I.



Cowshed of Trinidad College
at Trinidad, B.W.I.



Interior of Mr. Montagu Simpson's
Cowhouse, Zandfontein,
Johannesburg, South Africa



Cowshed of Barbados Dairy Co.
B.W.I.



Cow House of Mr. J. H. Myles
Wellington, New Zealand

WELL ARRANGED FARM BUILDINGS



Barns of Mr. L. S. Thompson, Dove Stock Farm, Port Dover, Ont.



Farm Buildings of
The Gloucester Lumber and Trading Co. Ltd.
Bathurst, N.B.



Farm Buildings of
Col. W. E. Phillips, Oriole, near Toronto, Ont.



Farm Buildings of
Mr. G. C. Leitch, Leitchcroft Farm Gormley,
near Toronto, Ont.



Farm Buildings of
Mr. J. Wm. Ferguson Mount Bernard Farms near London, Ont.

ILLUSTRATING FORE-
THOUGHT IN PLANNING



Farm Buildings of
Mr. S. C. Hadley, Sylvan Farms, Wheatley, Ont.



Farm Buildings of
Mr. Jas. D. Good, Normadale Farms Limited
London, Ont.



Farm Buildings of
Mr. Claude Gallinger, Killearn Farms, Tofield, Alta.



Farm Buildings of
"Leitchcroft" Experimental Farm of Master Feeds



Farm Buildings of
Mr. G. H. Wilson, Charing Cross, near Chatham, Ont.



Two of Four Dairy Barns -- over 100 cows in each
Walker Farms Limited, Walkerville, Ont.



Calf Barn at Walker Farms Limited



Bull and Cow Barn, Walker Farms



Bird's Eye View of Walker Farms Extensive Dairy Layout
fitted throughout with Beatty Stable Equipment



Barn arrangement at Frasea Farms Limited, as viewed from the
air, property of J. Grauer & Sons, Eburne, near Vancouver B.C.

Two-Storey, Loft-Type and One-Storey Barns

Most new Canadian barns are either two-storey or loft-type with hay, feed and bedding stored in mows over the stable.

The frame of the two-storey is high enough to allow loads to be driven up a ramp to the barn floor over the stable for unloading. The loft-type has a lower frame and no drive into the barn. Hay, sheaves and straw are lifted by a hay carrier into the mow through a door in the gable end of the barn. Grain is threshed outside and elevated directly into the granary. This saves the expense of building a ramp and barn floor.

The convenience of having feed and bedding stored directly above the stable saves time, steps and labor in caring for stock. Feed stored above provides insulation over mow floors. It prevents moisture condensing on the ceiling and helps keep the stable warm and dry in winter.

The ceiling should be tight to prevent dust from working through. Dust from grinding can be controlled by providing a separate feed room, conveniently located, with a tight partition separating it from the stable. Dust from hay can be confined by building chutes all the way down to the stable floor.

The two-storey and the loft-type barns are practical and the best types to build when constructing a complete new barn.

Loft-Type

The loft-type barn combines low structural cost with reasonable loft storage space and can be used wherever the loft is large enough to house the crop. It is widely used in Western Canada. It is also used for separate horse, hog and sheep barns and to extend the standard two-storey rectangular barn to make it L- or U-shape when more accommodation is required.

Loft-type provides a modern stable extension for an old-type hay barn. The end of the new extension can be attached anywhere to the side of the old barn. The width can be suitable to accommodate two rows of standing stalls and necessary pens when desired. This makes a modern, up-to-date stable at low cost. It saves raising the old barn which may be narrow and difficult to remodel into a good stable. It is possible at times to provide a feed room, horse stalls and pens in the old barn, using the modern new extension exclusively for cows. The loft-type barn is popular, low in cost, economical to build and can be extended any-time at minimum cost.

One-Storey

The one-storey stable, with insulated side walls and ceiling, is receiving favorable consideration, particularly in Western Canada where dry weather conditions in winter allows bulk feeds and bedding to be stacked outside without cover. Stacks are placed close to the stable door for convenient use. Concentrates and other grain feeds are stored in a feed room between the silos in the centre or at one end of the stable. Dust and chaff are easily controlled because no feed or bedding is stored above.

The frame of the one-storey barn is lighter than higher barns which have heavy weight to support. Where conditions are favorable and feed storage space easily available, the one-storey barn can be constructed at lowest cost. But the saving in first cost is largely offset by the extra steps, time and labor required to bring the feed and bedding from outside or from adjoining barns several times a day. While insulation solves some of the problems, condensation, dampness and extra labor in feeding have, so far, discouraged general use of the one-storey stable.

BARNs OF CANADIAN INDUSTRIAL FARMS



Dairy Barn, Prison Farm, Headingly, Man.



Barn of Industrial Farm, Burwash, Ont.



Barn at the Penitentiary Farm St. Vincent de Paul, Montreal, Que.



Barn at Prison Farm, Guelph, Ont.



Barn of the Indian Industrial School, Brandon, Man.



Barn of the Ontario Reformatory, Guelph, Ont.

Barn Framing

Plank of standard dimensions has taken the place of heavy timber in the construction of new, modern barns. The plank frame with either steel or wood truss, varying in height, width and length, has been used successfully over a period of many years. Skilled barn engineers and builders with wide experience designed plank and steel truss barns to combine economy and efficiency of materials with adequate strength and durability. In so doing, they greatly reduced the amount of lumber required for the barn. The plank frame can be built easier, with less help and in shorter time than the heavy timber frame, thus saving greatly the cost of barn construction. See pages 46 to 69.

Types of Roof

Three types of roof dominate in barn construction, Gambrel, Gothic, and Gable.

The Gambrel, commonly called the hip roof is most frequently used in Eastern Canada. It has close to one-third more capacity than the gable or straight-pitch type.

The Gothic roof, sometimes called the pointed arch, offers fine appearance and maximum mow capacity for the loft-type barn. It is used in Western Canada where the barns are not so high. It is not suitable for barns with high side framing.

The Gable, or straight-pitch, is frequently used for one-storey stables, hog houses and heavy timber barns.

All three types of roofs are well illustrated in the following pages and give details and capacities of the different barn frames shown. Each frame is designed to supply a definite need, depending on the method of farming, and storage capacity required.

Open Mows Save Time

Open mows save time in haying and harvest. The centre of the steel-truss and wood-truss plank frame barn is open. This allows hay and grain bundles to leave the load and enter the mow high enough to clear what is already in the mow. The bundles hang so far below the track that they can be swung easily to either side of the mow and dropped. The mow can be built up evenly. Time and labor is saved putting hay and grain into the mow and also taking it out for feeding. Barn floors are saved the shock of bundles dropped from the carrier at the barn peak. The time and labor saved makes the open-type plank frame barn or steel truss barn very popular.

The steel-truss barn with steel roofing and siding is rapidly gaining favor. Steel trusses come ready to erect. It is a big advantage to have trusses, roof, and siding all fire-proof. The steel-truss barn is shown on page 63.

Ground Floor Plans

The ground floor plans on pages 70 to 95 have been chosen from hundreds of barn layouts arranged and recently built by practical farmers. They are plans which have proved to be the most satisfactory in their different fields. The layouts reflect careful, experienced planning which combines economy with adequate space. These plans save material, save steps, save time and labor in doing the barn chores and, as well, provide maximum comfort for stock. A Beatty representative will help to select the plan most suitable to the builder's needs and adapt it to his requirements.





MODERN

B A R N F R A M E S

SECTION OF PLANK FRAME BARN

Designed with low gable roof for hog houses and single-storey loft-type stables.

6 ft. studs above 3 ft. stable-wall. Width 32 ft.

Capacity— $\left. \begin{array}{l} 2 \text{ tons of loose straw} \\ 3 \text{ tons of loose hay} \end{array} \right\} \text{ per 10 ft. of loft.}$

Height for hog houses, stable floor to joist 7 ft. 6 in., bottom of joist to peak 11 ft. 9 in.

Girder spacing, 12 ft.-8 ft.-12 ft., 32 ft. wide outside.

SPECIFICATIONS

Rafters.....	2" x 5"-24" O.C.	Studding.....	2" x 4"-24"
Ridge Ties.....	1" x 8"	Sill.....	2" x 4"
Purlin.....	6" x 6"	Joists.....	2" x 6"-24" O.C.
Purlin Post.....	4" x 6" O.C.	Girder.....	3-2" x 8" and 2-2" x 4"
Plate.....	2-2" x 4"	Wall, Concrete.....	8"
Ribbon.....	1" x 4"	Footing, Concrete.....	10"

This type of frame may be built any width up to 38 ft. and with studs 6 ft. to 10 ft. high. Studs should extend at least 1 ft. above joist. For stables over 34 ft. wide and studs over 8 ft. high use heavier specifications. Recommended ceiling heights from stable floor to joist: Hogs and sheep 7 ft. 6 in., cattle 8 ft. 6 in., horses 9 ft.

Note: Rafters may be 30" O.C. when galvanized iron roofing is used.



Hog Barn of Mr. W. G. Thompson, Berlin, Ont.



Hog Barn of Mr. Jack Fraser, Dufferin St. near Toronto, owner of Jack Fraser Stores.



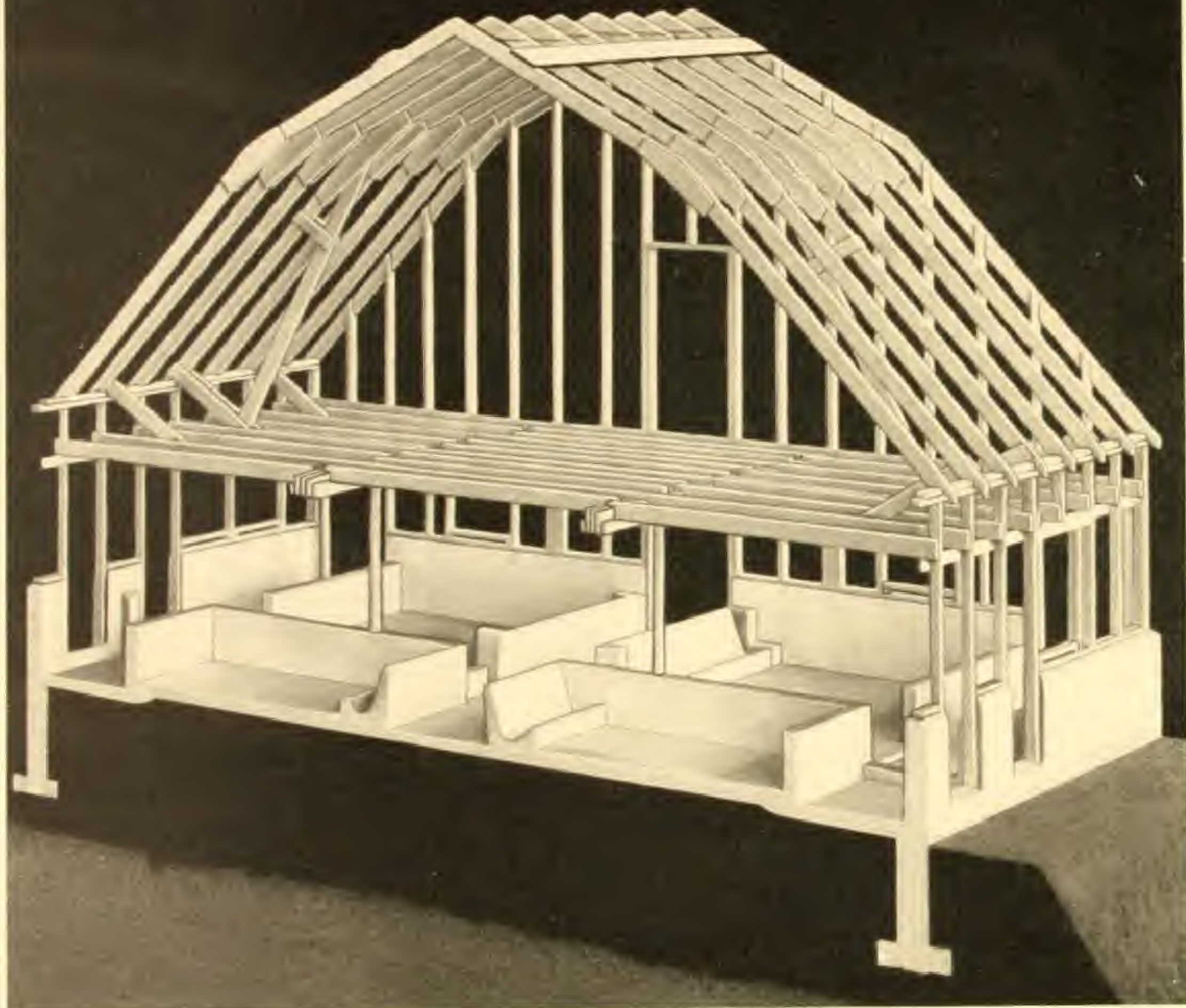
Hog Barn of Oshawa Dairy Limited, Oshawa, Ont.



Hog Barn of Donalda Farms, Duncan, Ont.



Hog Barn of Mr. A. Desrosiers, Verner, Ont.



SECTION OF PLANK FRAME BARN

Designed with low gambrel roof for hog houses and single-storey loft-type stables.

6 ft. studs above 3 ft. stable wall. Width 36 ft. outside.

Capacity— $\left. \begin{array}{l} 4 \text{ tons of loose straw} \\ 5 \text{ tons of loose hay} \end{array} \right\} \text{ per 10 ft. of loft.}$

Height for hog houses, stable floor to joist 7 ft. 6 in., bottom of joist to peak 16 ft.

Girder spacing, 12 ft.-12 ft.-12 ft., 36 ft. wide outside.

SPECIFICATIONS

Rafters	2" x 6"-24" O.C.	Ribbon	1" x 4"
Ridge Ties	1" x 8"	Sill	2" x 4"
Fish Plates	2-1" x 8"	Joist	2" x 6"-16" and 24" O.C.
Hip Brace	2" x 6"-8" O.C.	Girder	4-2" x 8" and 2-2" x 4"
Plate	2-2" x 4"	Wall, Concrete	8"
Studding	2" x 4"-24" O.C.	Footing, Concrete	10"

This type of frame may be built any width up to 38 ft. and with studs 6 ft. to 10 ft. high. Studs should extend at least 1 ft. above joist. For frames larger than above, use heavier specifications—see page 55.

Recommended ceiling heights from stable floor to joist: Hogs and sheep 7 ft. 6 in., cattle 8 ft. 6 in., horses 9 ft.

Note: Rafters may be 30" O.C. when galvanized iron roofing is used.



Barn of Mr. Clifford Zilke, Wetaskiwin, Alta.



Barn of Mr. N. Swalm, Didsbury, Alta.



Barn of Mr. Fred Dickau, Wetaskiwin, Alta.



Barn of the late Mr. Geo. Wright, Penhold, Alta.



Barn of Mr. P. Dumaine, Ile des Chênes, Man.



SECTION OF GOTHIC FRAME BARN

Designed for western barns with laminated gothic truss and gothic roof.
7 ft. studs above 1 ft. concrete stable wall. Width 36 ft.

Capacity—7 to 8 tons of loose hay per 10 ft. of mow.

Height—Stable floor to joist 8 ft. 6 in., bottom of joist to peak 23 ft.

Girder spacing, 12 ft.-12 ft.-12 ft., 36 ft. wide outside. Bent or truss spacing,
one every 8 ft.

SPECIFICATIONS

Rafters	4-1" x 10" on edge (cut to radius) and	Strutting	2" x 6"-24" O.C.
	2-1" x 4" on flat — 8' O.C.	Sill	2" x 6"
Collar Ties	2-2" x 10"	Lookouts	2" x 6"
Ridge Ties	2-2" x 8"	Joist	2" x 10"-24" O.C.
Ribs	2-1" x 4"-24" O.C.	Girder	5-2" x 10"
Purlin	2" x 4"	Wind Brace and End Post	2-2" x 6"
Plate	2-2" x 6"	Wall, Concrete	8"
		Footings, Concrete	10"

This type of frame may be built any width up to 50 ft. Studs not recommended to extend above joist. For frames over 40 ft. in width, use heavier specifications.



Barn of Mr. L. B. Spencer, St. Catharines, Ont.



Horse Barn of University of Alta. Edmonton, Alta.



Barn of Mr. Claude Gallinger, Taber, Alta.



Horse Barn of Mr. R. McClelland, Maple, Ont.



Horse Barn of Mr. Geo. H. May, London, Ont.



Hog and Steer Barns of Mr. Wm. E. Adams,
Tillsonburg, Ont.



Horse Barn of Col. W. E. Phillips, Oriole, Ont.



Dairy and Horse Barns at Leitchcroft Farm, Gormley, Ont.



Barn of Mr. Ross Kohler, Cayuga, Ont.



Barn of Mr. Frank H. Silcox, Inos, Ont.



Barn of Mr. A. E. Dunwill, Sardis, B.C.



Greybrook Farm Barn, Pitt Meadows, B.C.



SECTION OF PLANK FRAME BARN

Loft or storey-and-half type, braced rafter construction. Gambrel roof. Designed for small barns, horse stables or low extensions to accommodate cow stalls or pens.

12 ft. studs above a 1 ft. concrete stable wall. Width 36 ft.

Capacity—8 to 10 tons of loose hay per 10 ft. of mow.

Height—Stable floor to joist 8 ft. 6 in., bottom of joist to plate 4 ft. 6 in., plate to hip 11 ft., hip to peak 7 ft.

Girder spacing, 12 ft.-12 ft.-12 ft., 36 ft. wide outside.

SPECIFICATIONS

Rafters	2" x 6"-24" O.C.	Sill	2" x 6"
Ridge Ties	1" x 8"	Joist	2" x 10"-24" O.C.
Rafter Ties	2-1" x 6"	Girder	5-2" x 10"
Plate	2-2" x 6"	Wind Brace	2-2" x 6"
Rafter Brace	2" x 6"-8" O.C.	End Post	3-2" x 6"
Studding	2" x 6"-24" O.C.	Wall, Concrete	8"
Ribbon	1" x 4"	Footing, Concrete	10"

This type of frame may be built any width up to 38 ft. and with studs 10 ft. to 12 ft. high. For larger barns see page 57 and use heavier specifications. Recommended ceiling heights from stable floor to joist: Hogs and sheep 7 ft. 6 in., cattle 8 ft. 6 in., horses 9 ft.

Note: Rafters may be 30" O.C. when galvanized iron roofing is used.



Barn of Mr. Geo. Pyke, Wolfe Island, near Kingston, Ont.



Barn of
Mr. Louis Kelly, Iberville, Que.



Barn of Mr. Thos. Nowlan. Moncton, N. B.



Barn of
Mr. M. E. Binz, Baie d'Urfe, near Montreal, Que.



SECTION OF PLANK FRAME BARN

Loft or storey-and-half type, braced rafter construction. Gambrel roof. Designed for low-cost ground drive or end-lift barns.

16 ft. studs above a 1 ft. concrete stable wall; width 36 ft.

Capacity—12 to 13 tons of loose hay per 10 ft. of mow.

Height—Stable floor to joist 8 ft. 6 in., bottom of joist to plate 8 ft. 6 in., plate to hip 11 ft., hip to peak 7 ft.

Girder spacing, 12 ft.-12 ft.-12 ft., 36 ft. wide outside.

SPECIFICATIONS

Rafters.....	2" x 6"-24" O.C.	Sill.....	2" x 6"
Ridge Ties.....	1" x 8"	Joist.....	2" x 10"-24" O.C.
Rafter Ties.....	2-1" x 6"	Girder.....	5-2" x 10"
Plate.....	2-2" x 6"	Wind Brace.....	2-2" x 6"
Studding.....	2" x 6"-24" O.C.	End Posts.....	3-2" x 6"
Studding Brace.....	2" x 6"-8' O.C.	Wall, Concrete.....	8"
Ribbon.....	1" x 4"	Footings, Concrete.....	10"

This type of frame may be built any width up to 40 ft. and with studs 14 ft. to 16 ft. high. For barns over 36 ft. wide use heavier specifications.

Note: Rafters may be 30" O.C. when galvanized iron roofing is used.



Barn of Mr. Ed. H. Nelson, London, Ont.



Barn of Mr. Willis Swanton, Waterford, Ont.



Barn of Mr. H. L. McCaw, Smiths Falls, Ont.



Barn of Mr. J. W. Bowser, Newmarket Ont.



SECTION OF PLANK FRAME BARN

Designed for two rows of equipment.

Plank truss with gambrel roof.

16 ft. post above wall built to window sill; width 36 ft.

Capacity—13 to 14 tons of loose hay per 10 ft. of mow.

Height—Stable floor to joist 8 ft. 6 in., bottom of joist to plate 10 ft. 6 in., plate to hip 12 ft., hip to peak 6 ft. 6 in.

Girder spacing, 12 ft.-12 ft.-12 ft., 36 ft. wide outside.

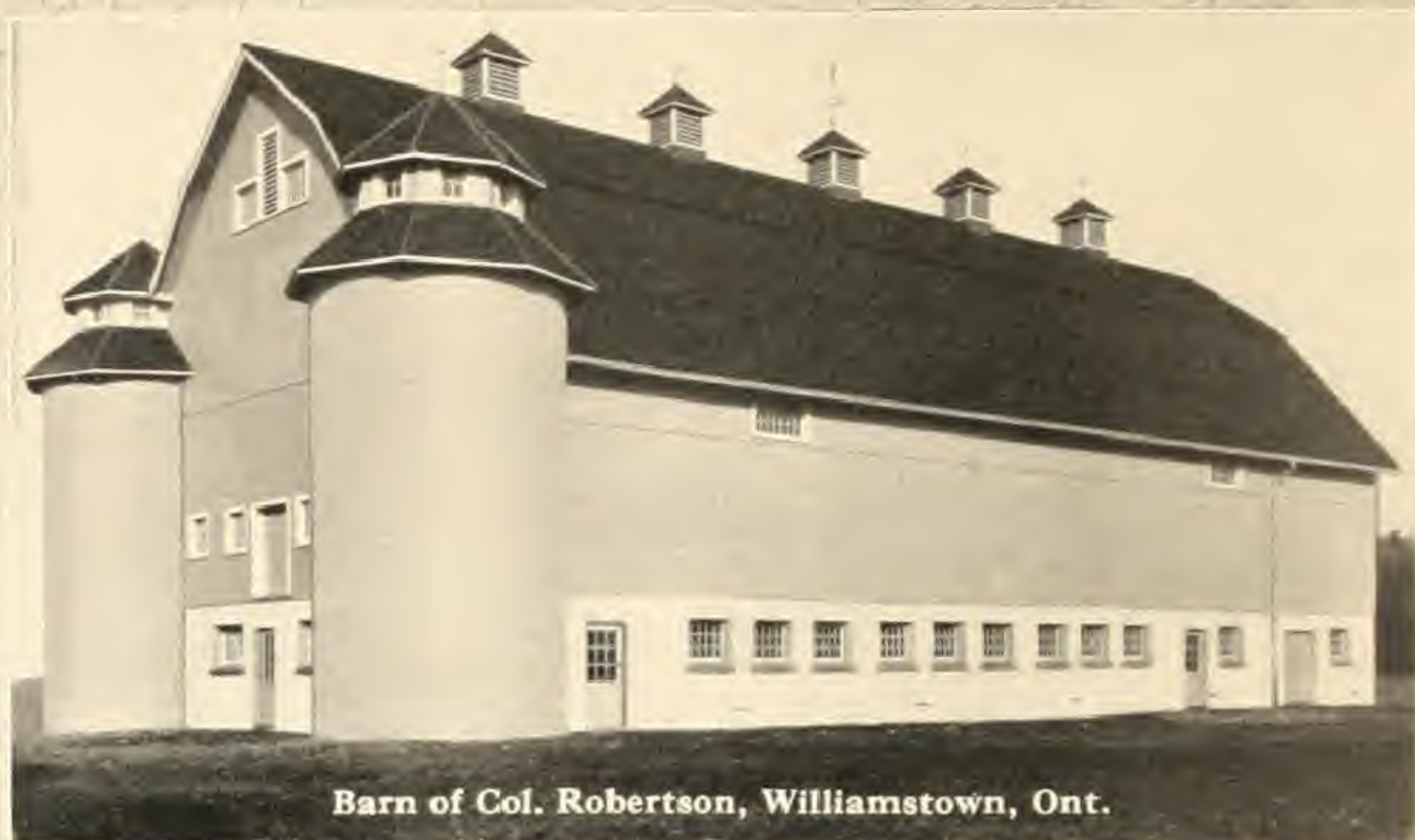
Bent spacing 20 ft. or less.

SPECIFICATIONS

Rafters	2" x 6"-24" O.C.	Girts	2" x 4" and 2" x 10"
Collar Ties	2" x 10"	Plate Lower	2-2" x 6"
Truss Tie	2" x 6"	Sill	2" x 6"
Ridge Support	2" x 12"	Joist	2" x 10"-16" O.C. and 24" O.C.
Purlin Support	2-2" x 10"	Chord, outside	3 runs 2" x 10", inside
Purlin Plate	1-2" x 4" 3-2" x 10"		2 runs 2" x 10"
Ridge Support to Purlin		Girder	5-2" x 12"
(braces)	4-2" x 8"	Wind Brace	2-2" x 8"
Plate Upper	3-2" x 8"	Wind Brace and End Post	3-2" x 6"
Truss Post	2-2" x 6"	Wall, Concrete	10"
Strutting and Braces	2" x 6" or 2" x 8"	Footing, Concrete	12"

This type of frame may be built any width up to 40 ft. and with posts 16 ft. to 20 ft. high. For barns over 36 ft. wide and posts over 16 ft. high use heavier specifications.

Note: Rafters may be 30" O.C. when galvanized iron roofing is used.



Barn of Col. Robertson, Williamstown, Ont.



Barn of Mr. Hanford McKnight, Apohaqui, N.B.



Barn of Mr. J. C. Bell & Son, Freeman, Ont.



Barn of The T. Eaton Co. Limited, Islington, near Toronto, Ont.



SECTION OF PLANK FRAME BARN

Designed for two rows of equipment.

Plank truss with gambrel roof.

16 ft. post above stable; width 36 ft.

Capacity—16 to 18 tons of loose hay per 10 ft. of mow.

Height—Stable floor to joist 8 ft. 6 in., bottom of joist to plate 16 ft., plate to hip 12 ft., hip to peak 6 ft. 6 in.

Girder spacing, 12 ft.-12 ft.-12 ft., 36 ft. wide outside.

Bent spacing 20 ft. or less.

SPECIFICATIONS

Rafters	2" x 6"-24" O.C.	Girts	2" x 4" and 2" x 10"
Collar Ties	2" x 10"	Sill	2" x 10"
Truss Tie	2" x 6"	Joist	2" x 10"-16" O.C. and 24" O.C.
Ridge Support	2" x 12"	Chord, outside 3 runs 2" x 10", inside	2 runs 2" x 10"
Purlin Support	2-2" x 10"	Girder	6-2" x 12"
Purlin Plate	1-2" x 4", 3-2" x 10"	Wind Brace	2-2" x 8"
Ridge Support to Purlin (braces)	4-2" x 8"	Wind Brace and End Post	2-2" x 8"
Plate	3-2" x 10"	Wall, Concrete	10"
Truss Post	2-2" x 8"	Footing, Concrete	12"
Strutting and braces	2" x 8"		

This type of frame may be built any width up to 40 ft. and with posts 12 ft. to 16 ft. high. For barns over 36 ft. wide use heavier specifications.

Note: Rafters may be 30" O.C. when galvanized iron roofing is used.



Barn of Mr. Campbell Richardson, Fergus, Ont.



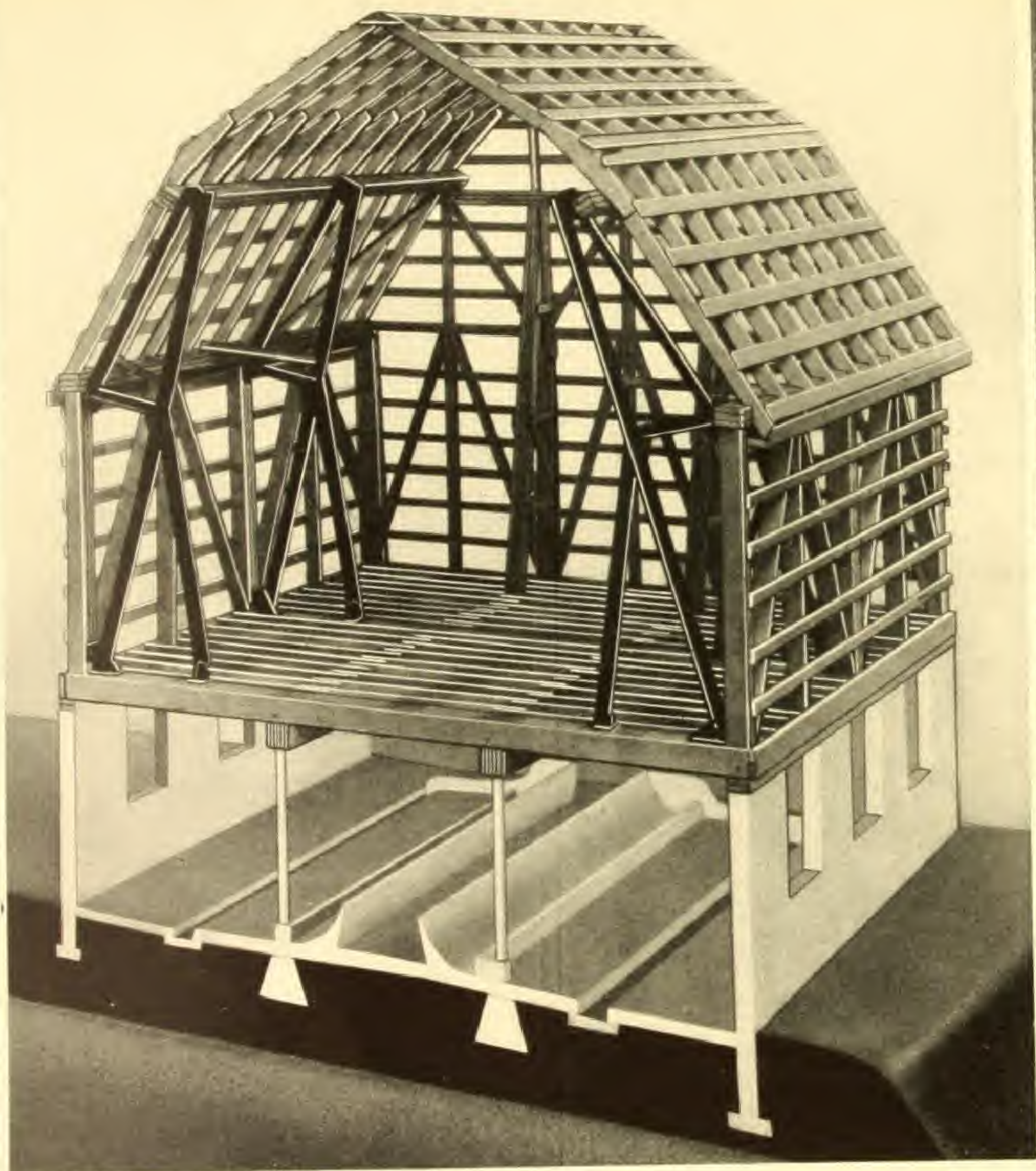
Barn of Mr. William Gorman
Kilworth Hall Jersey Farm, Komoka, Ont.



Barn of Mr. Wm. F. Bradish, Glanworth, Ont.



Barn of Mr. Victor Nerlich, Galt, Ont.



SECTION OF PLANK FRAME BARN

Steel truss with steel knee brace and gambrel roof.

Standard post above stable wall.

Capacity of 36 ft. width, 16 tons of loose hay per 10 ft of mow.

SPECIFICATIONS

Rafters	2" x 6"-30" O.C.	Lower Beam	3-2" x 8"
Plate and Top Beam	5-2" x 10"	Posts	3-2" x 8"
Girder	6-2" x 12"	Girts	2" x 4"
Joist	2" x 10"-16" O.C. and 24" O.C.	Sill	2" x 10" flat, 2" x 10" on edge
Purlin Plate	3-2" x 8"	Wall, Concrete	10"
Studding	2" x 8"	Footing, Concrete	12"
Purlin	1" x 4" and 1" x 6"		

Courtesy Eastern Steel Products Limited, Preston, Ontario.



Barn of the Late R. J. Fleming, Donlands, Ont.



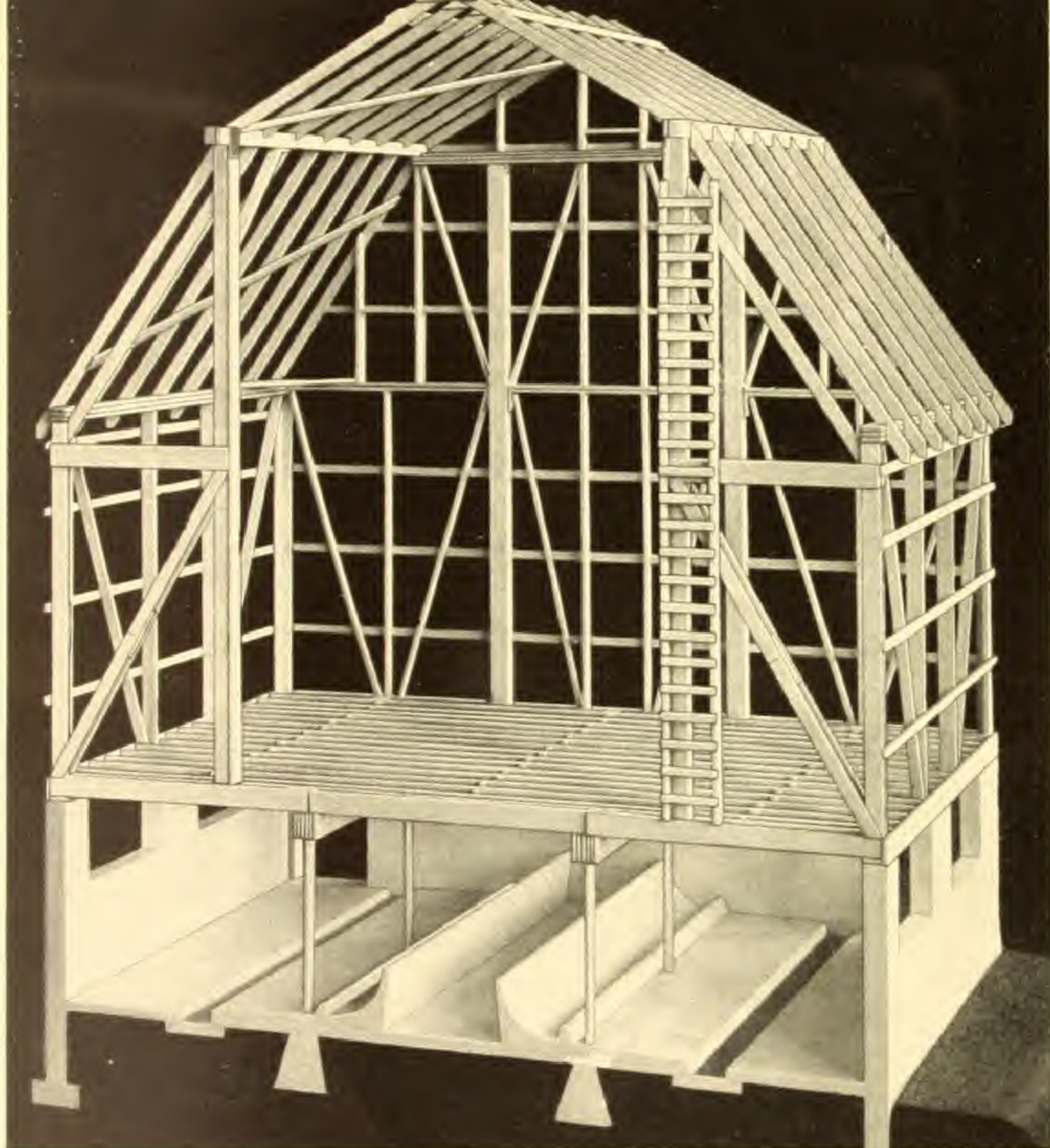
Barn of Laurum Farms, Durham, Ont.



Barn of the Ontario Dairy Co. near Toronto



Barn of Mr. Jack Fraser, Jack Fraser Stores, near Toronto



SECTION OF PLANK FRAME BARN

Designed for two rows of equipment.

Plank truss with purlin post and gambrel roof.

16 ft. post above stable; widths 36 ft., 38 ft., or 40 ft.

Capacity of 36 ft. width—16 to 18 tons of loose hay per 10 ft. of mow.

Height of 36 ft. width—stable floor to joist 8 ft. 6 in., bottom of joist to plate 16 ft., plate to purlin 12 ft., purlin to peak 6 ft.

Girder spacing, 12 ft.-12 ft.-12 ft., for 36 ft., or 14 ft.-12 ft.-14 ft., for 38 ft. and 40 ft. wide outside.

Bent spacing, 20 ft. or less.

SPECIFICATIONS FOR 36 FT. WIDTH

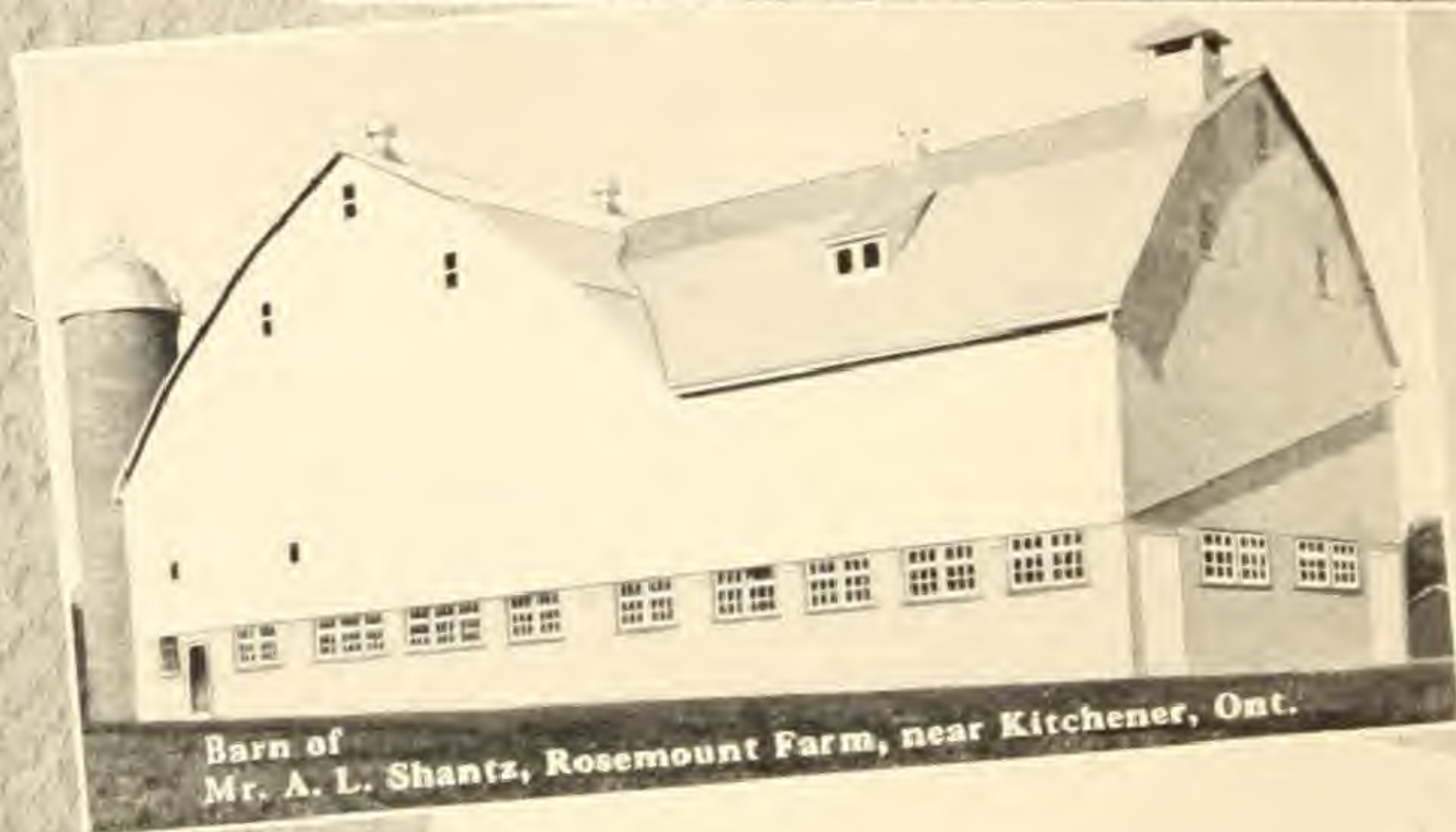
Rafters	2" x 6"-24" O.C.	Plate (side)	3-2" x 10"
Ridge Ties	2" x 10"	Plate (end)	2-2" x 10"
Purlin Plate (side)	10" x 10"	Sill	2" x 8"
Purlin Plate (end)	3-2" x 8"	Studding and Braces	2" x 6"
Purlin Post (face with 2" x 10")	3-2" x 10"	Joist	2" x 10"-12"-16"-24" O.C.
Post to Purlin Post Tie	2-2" x 10"	Chord	3-2" x 10"
Upper Purlin Post Tie and Brace	2" x 6"	Girder	5-2" x 12"
Lower Purlin Post Tie and Brace	2-2" x 6"	Girts	2" x 4", 2" x 10"
Truss Post	2-2" x 8"	Wall, Concrete	10"
End Post	5-2" x 8"	Footing, Concrete	12"
Corner Post	3-2" x 8"		

This type of frame may be built any width up to 50 ft. See page 67.

Note: Rafters may be spaced 30" O.C. when galvanized iron roofing is used.



Barn of Mr. W. P. Watt, Maple Ridge Farm, Waterford, Ont.



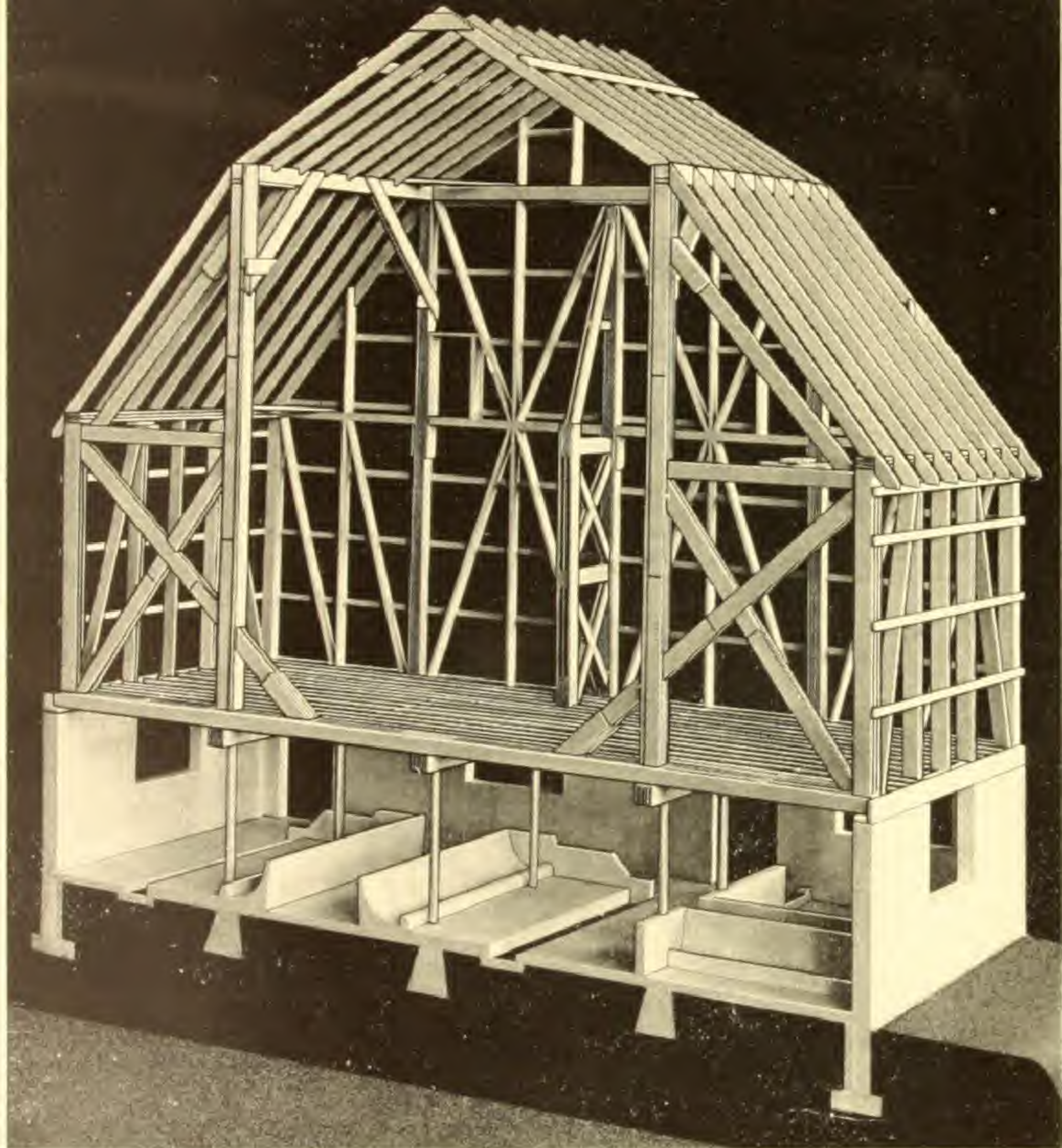
Barn of Mr. A. L. Shantz, Rosemount Farm, near Kitchener, Ont.



Barn of Mr. B. R. Leech, Leechwood Farm, near Toronto, Ont.



Barn of Armstrong Bros. A. B. C. Farms, Brampton, Ont.



SECTION OF PLANK FRAME BARN

Wide type designed for three rows of equipment.

Plank truss with purlin post and gambrel roof; 14 ft. or 16 ft. post above stable; width 48 ft.

Capacity—27 to 29 tons of loose hay per 10 ft. of mow.

Height—Stable floor to joist 8 ft. 6 in., bottom of joist to plate 14 ft. or 16 ft., plate to purlin 14 ft., purlin to peak 9 ft. 6 in.

Girder spacing, 12 ft.-12 ft.-12 ft.-12 ft.-48 ft. wide outside.

Bent spacing, 20 ft. or less.

SPECIFICATIONS

Rafters	2" x 6"-24" O.C.	Wind Brace—upper	2-2" x 10"
Collar Ties	2" x 10"	Wind Brace—lower	5-2" x 10"
Purlin Plate—side and end	10" x 10"	Sill	2" x 10"
Purlin Post (face with 2" x 10")	5-2" x 10"	Strutting and Braces	2" x 8"
Post to Purlin Post Tie	2-2" x 10"	Joist	2" x 10"-12" and 18" O.C.
Upper Purlin Post Tie and Brace	2" x 10"	Chord	4-2" x 10"
Lower Purlin Post Tie and Brace	3-2" x 10" except at cross	Girder	6-2" x 12"
Truss Post	3-2" x 10"	Girts	2" x 4"
Truss Post Tie and Brace	2-2" x 10" filled	Lower Girt	2" x 12"
End and Corner Posts	5-2" x 10"	Wall, Concrete	12"
Plate—side and end	3-2" x 10"	Footing, Concrete	14"

This type of frame may be built up to 50 ft. wide; over 50 ft., ask about heavier framing.

Note: Rafters may be spaced 30" O.C. when galvanized iron roofing is used.



Barn of Mr. J. Burnthorn Cox, Kingsport, N.S.



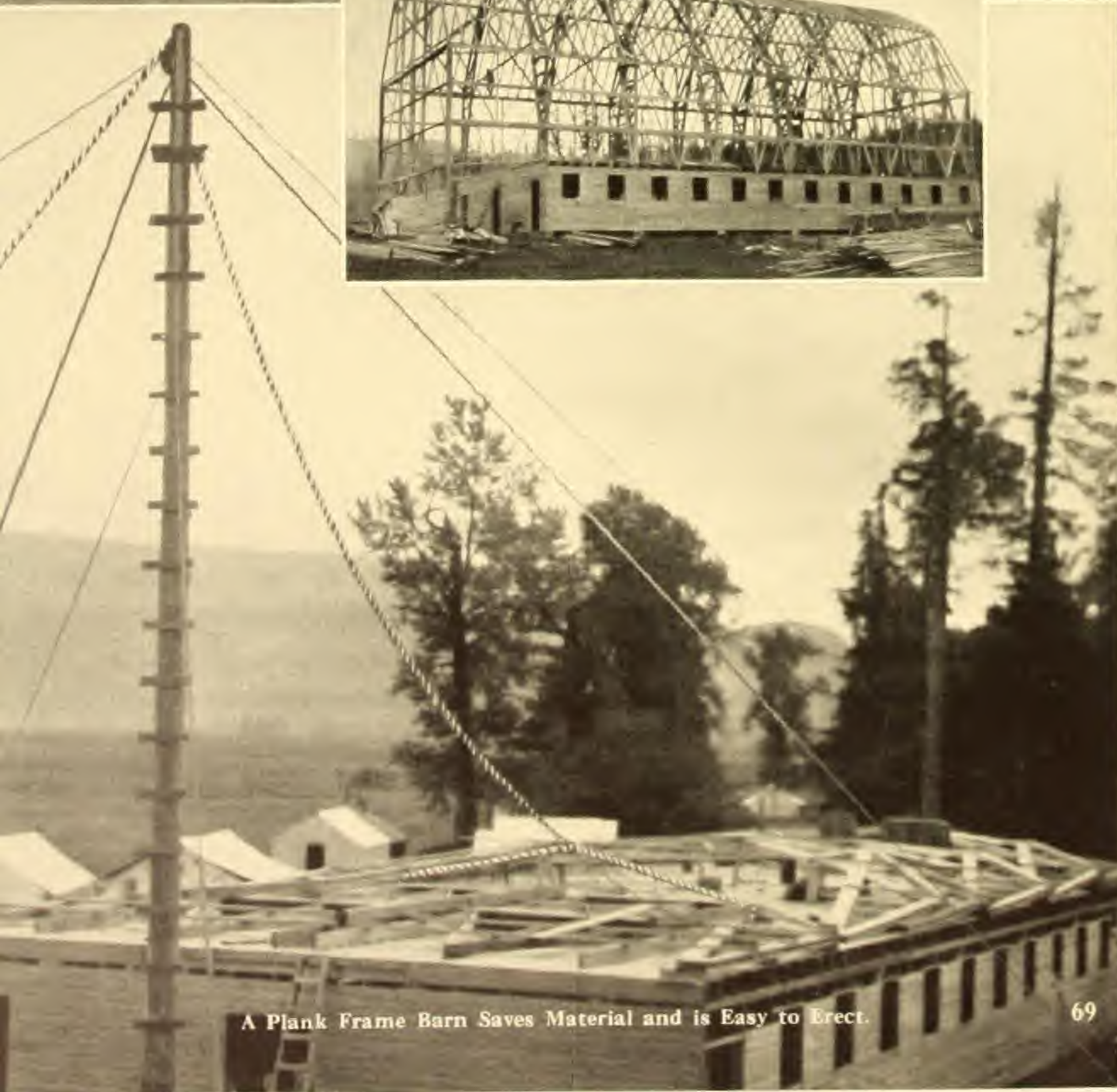
Barn of Mr. M. B. Wiedrick & Sons, Waterford, Ont.



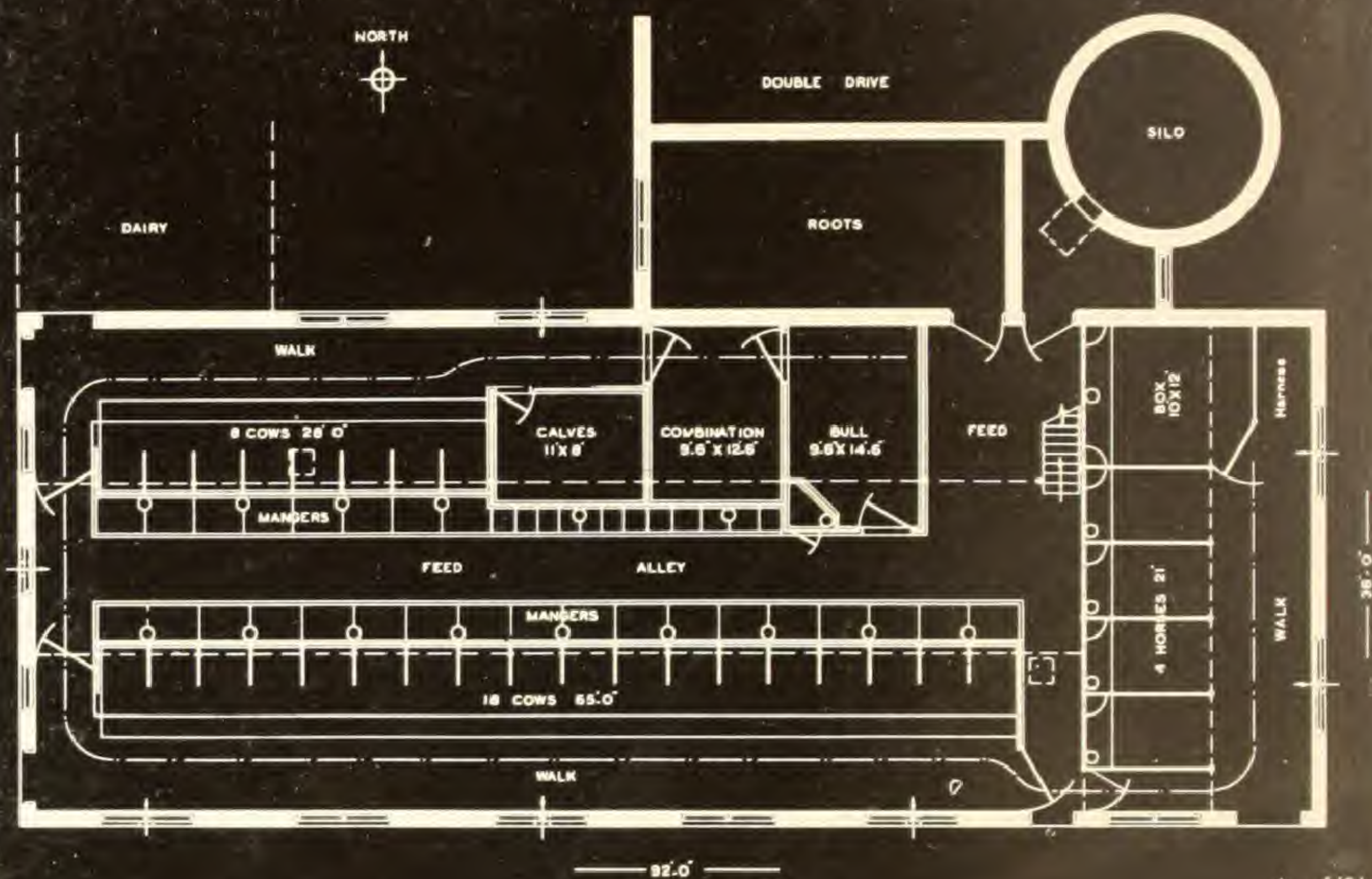
Barn of Mr. James B. Graham, Copetown, Ont.



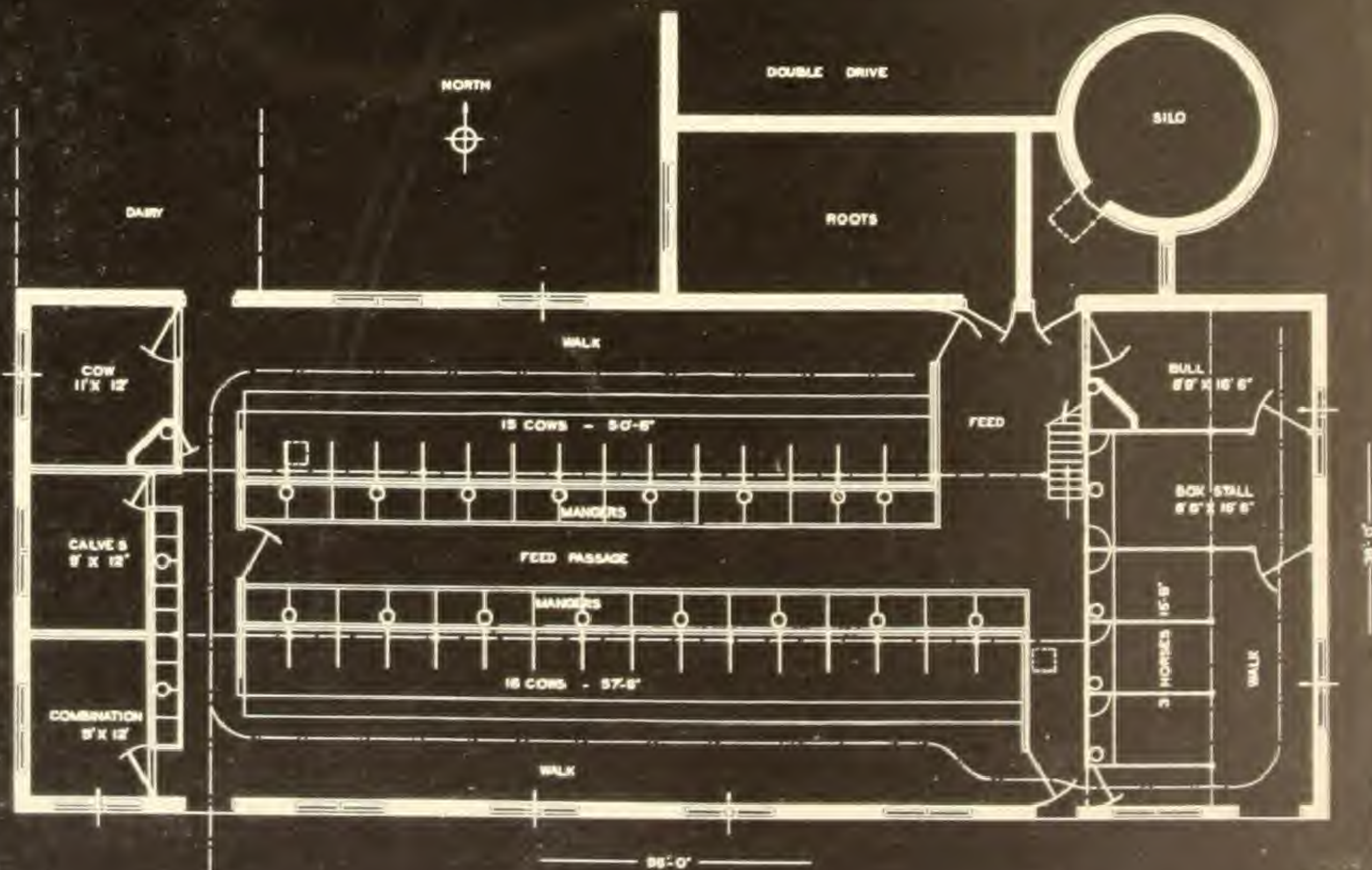
Barn of Mr. D. R. McLaughlin, Georgetown, Ont.



A Plank Frame Barn Saves Material and is Easy to Erect.

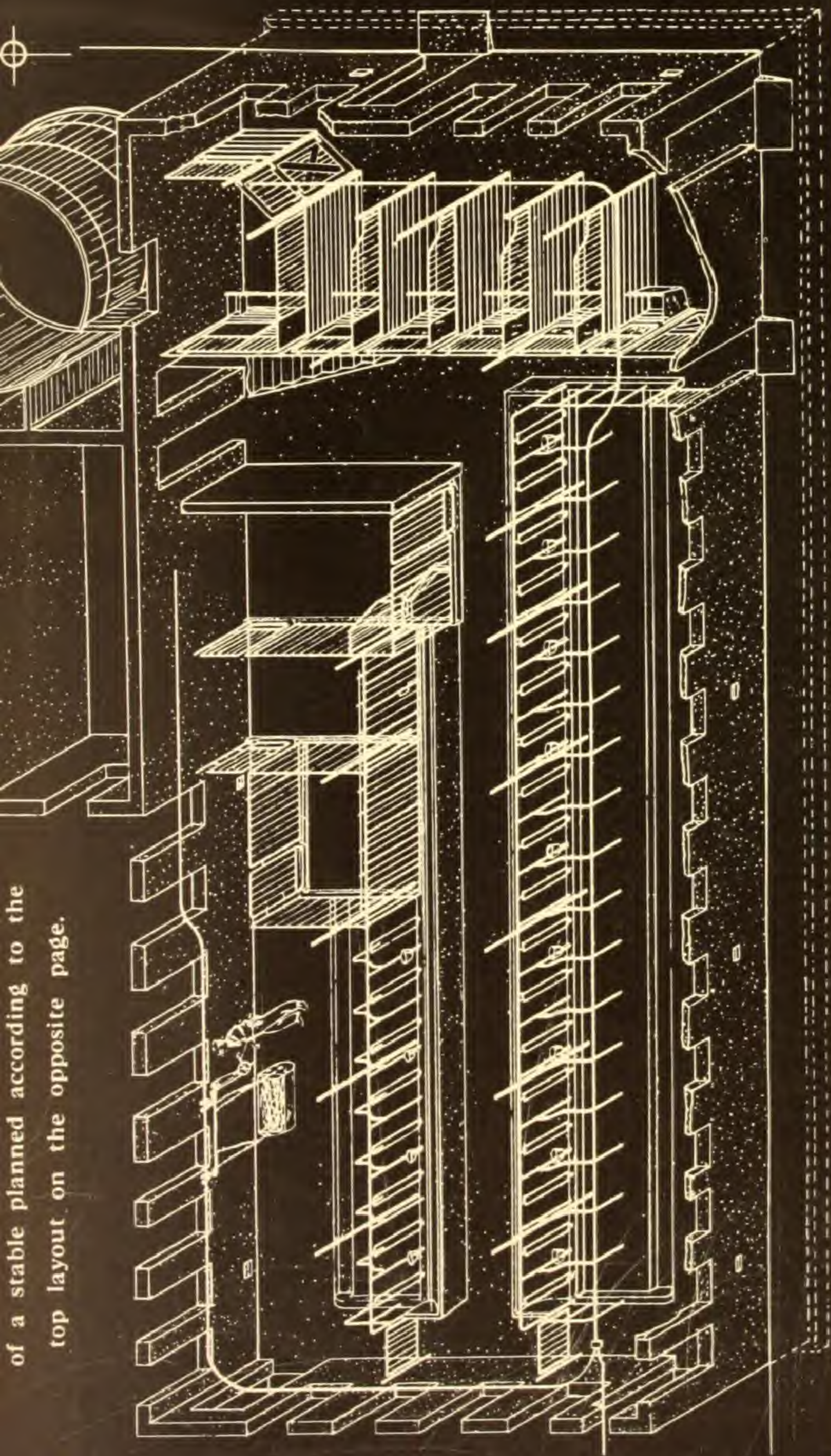


The illustration on the opposite page shows a stable arranged according to the floor plan above.



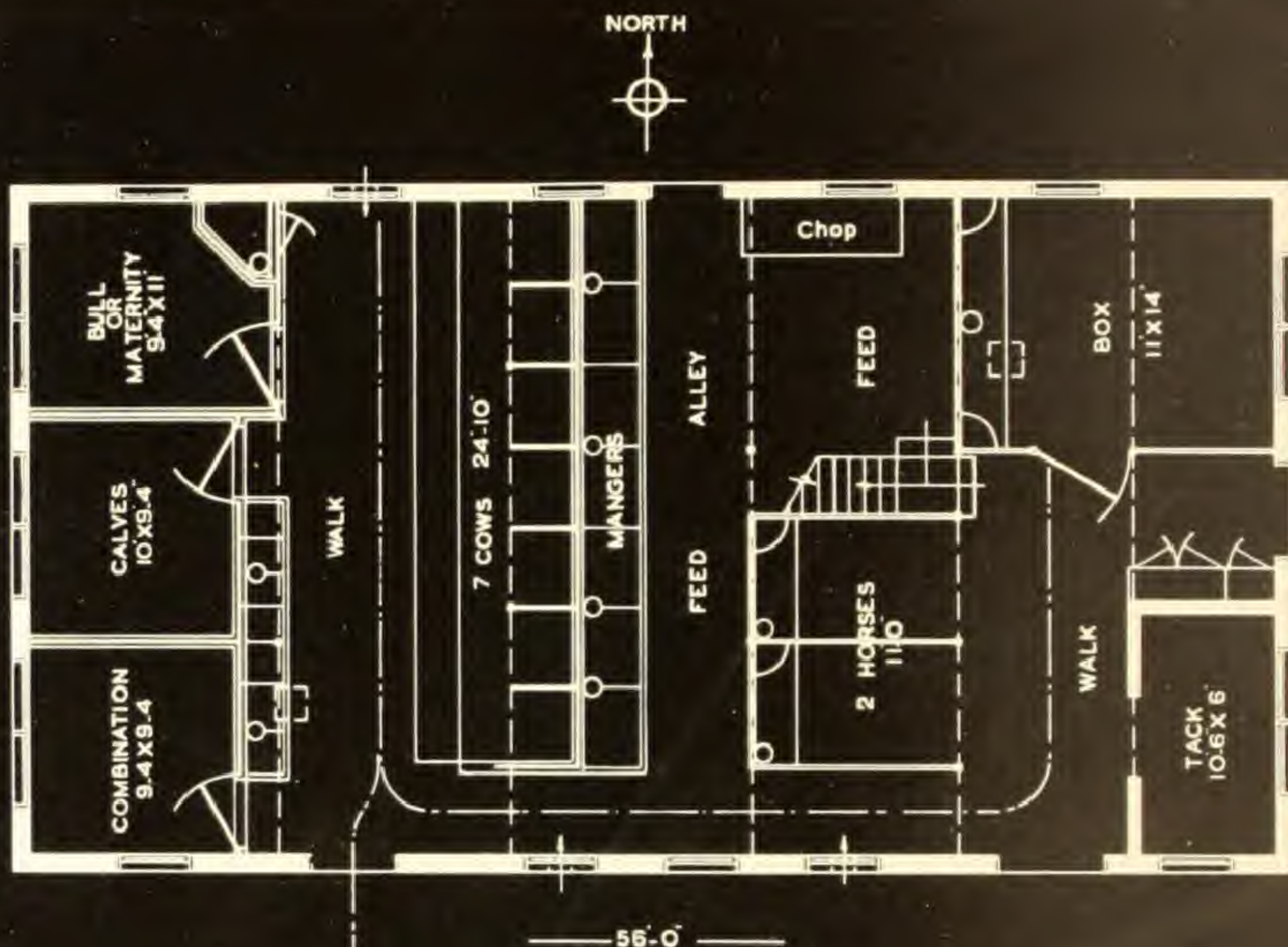
Above are two good stable plans for mixed or dairy farming, no waste space, no lost steps in these plans.

of a stable planned according to the
top layout on the opposite page.



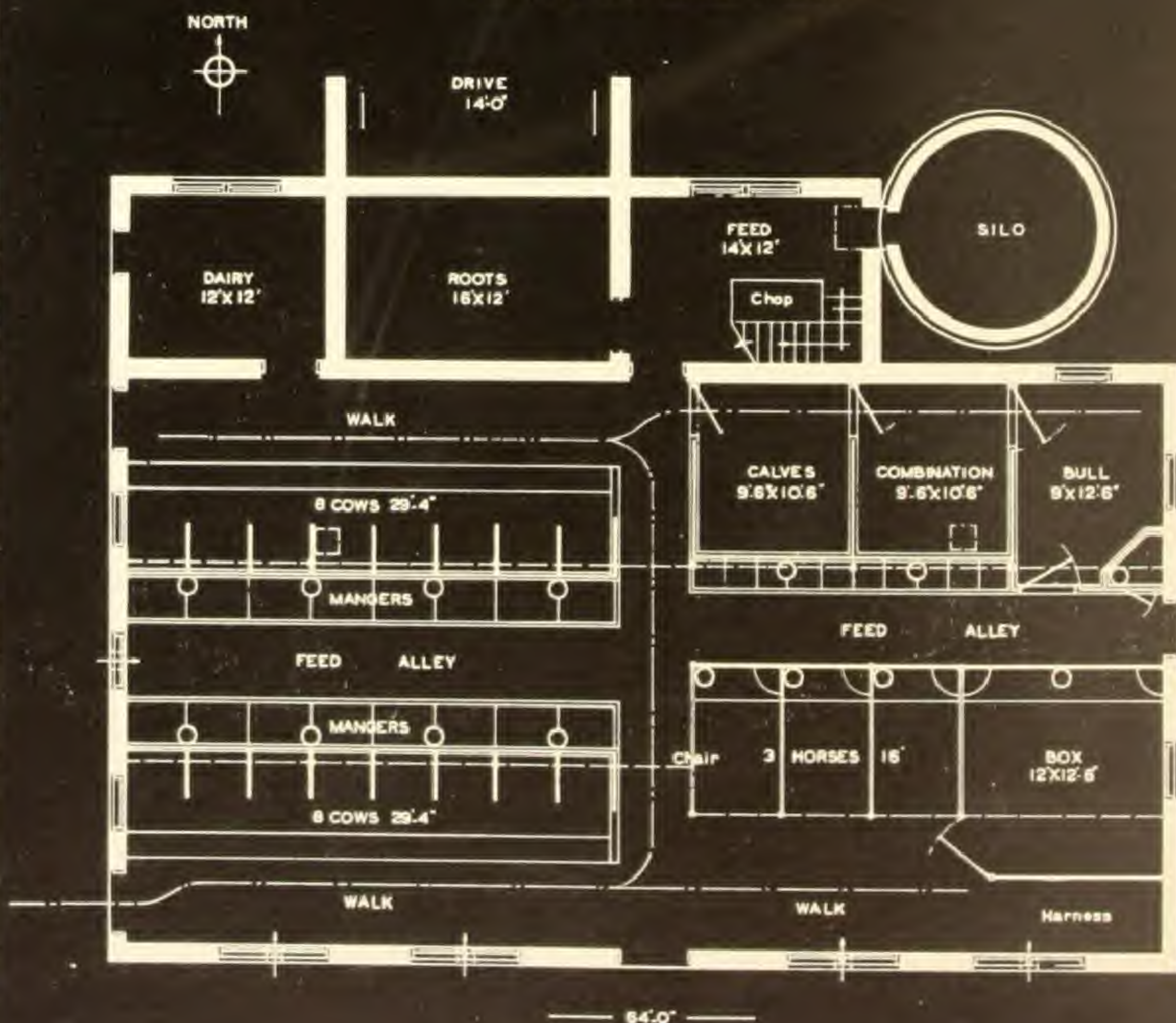
**GROUND
FLOOR**

B A R N P L A N S



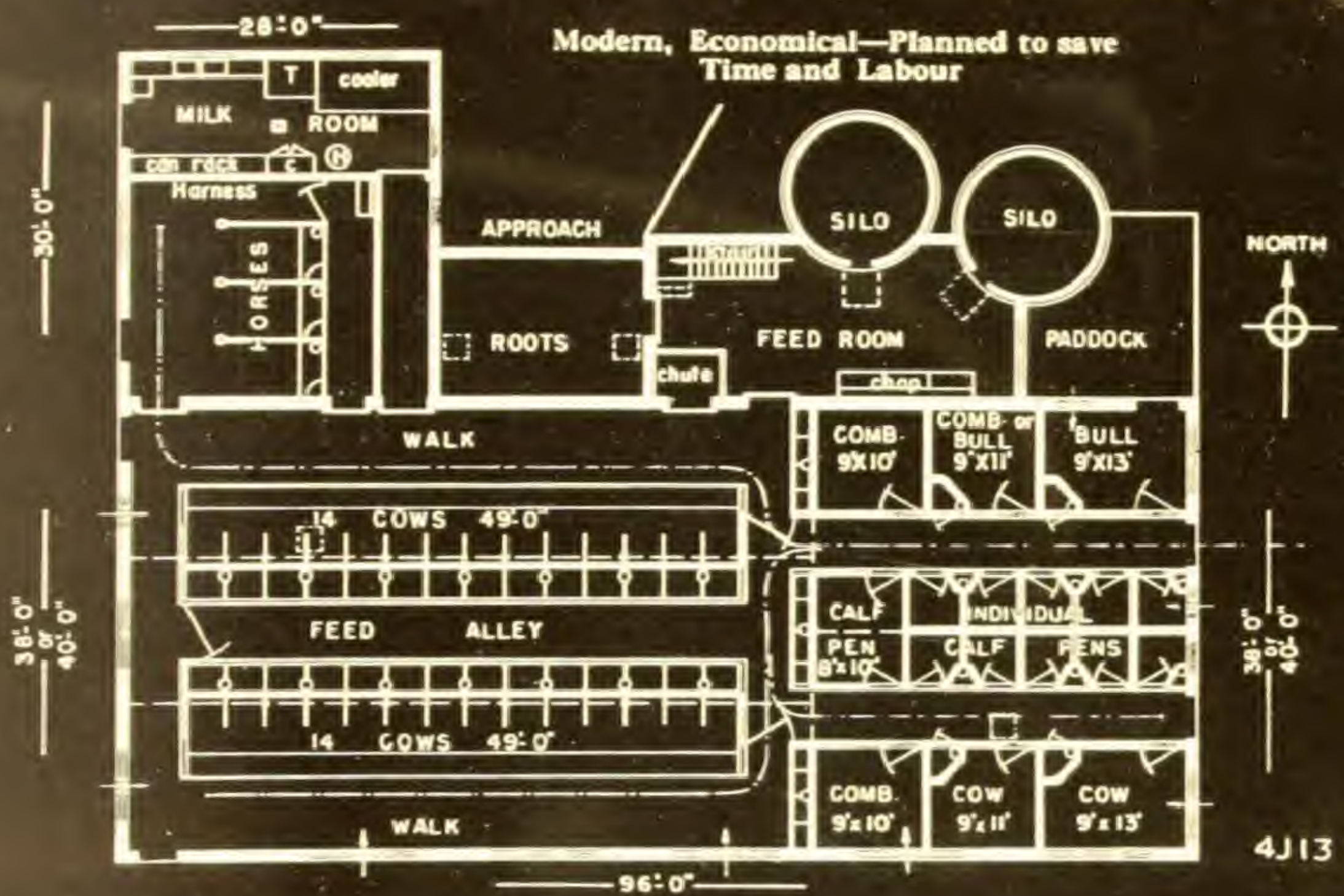
4J03

Plan for the small estate

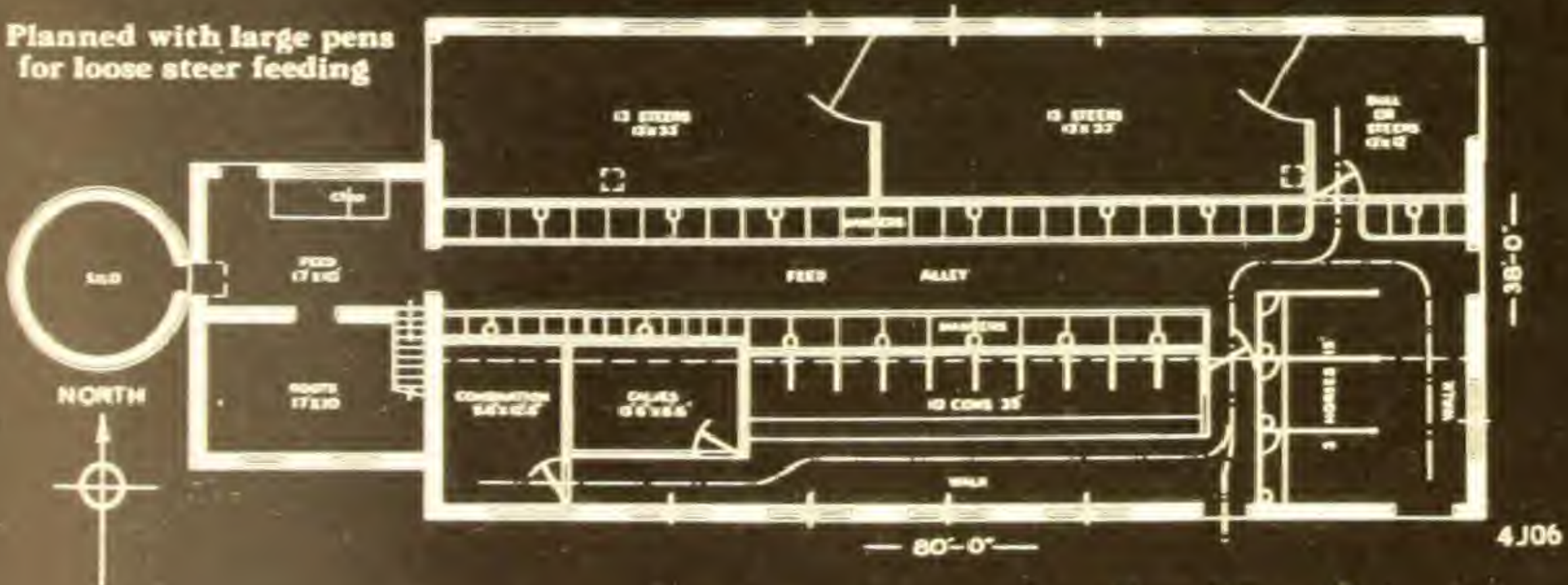


4J04

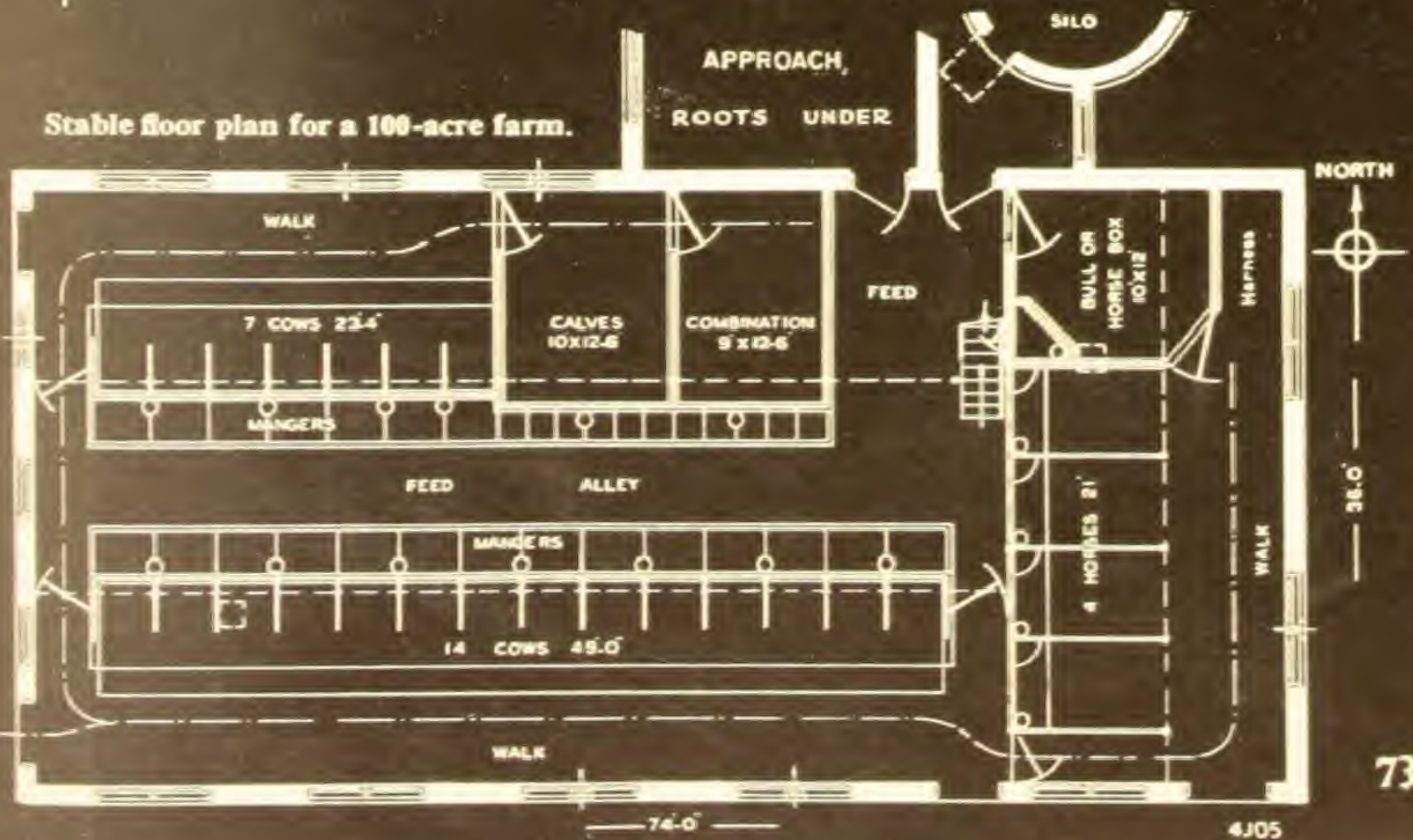
Plan for the small farm

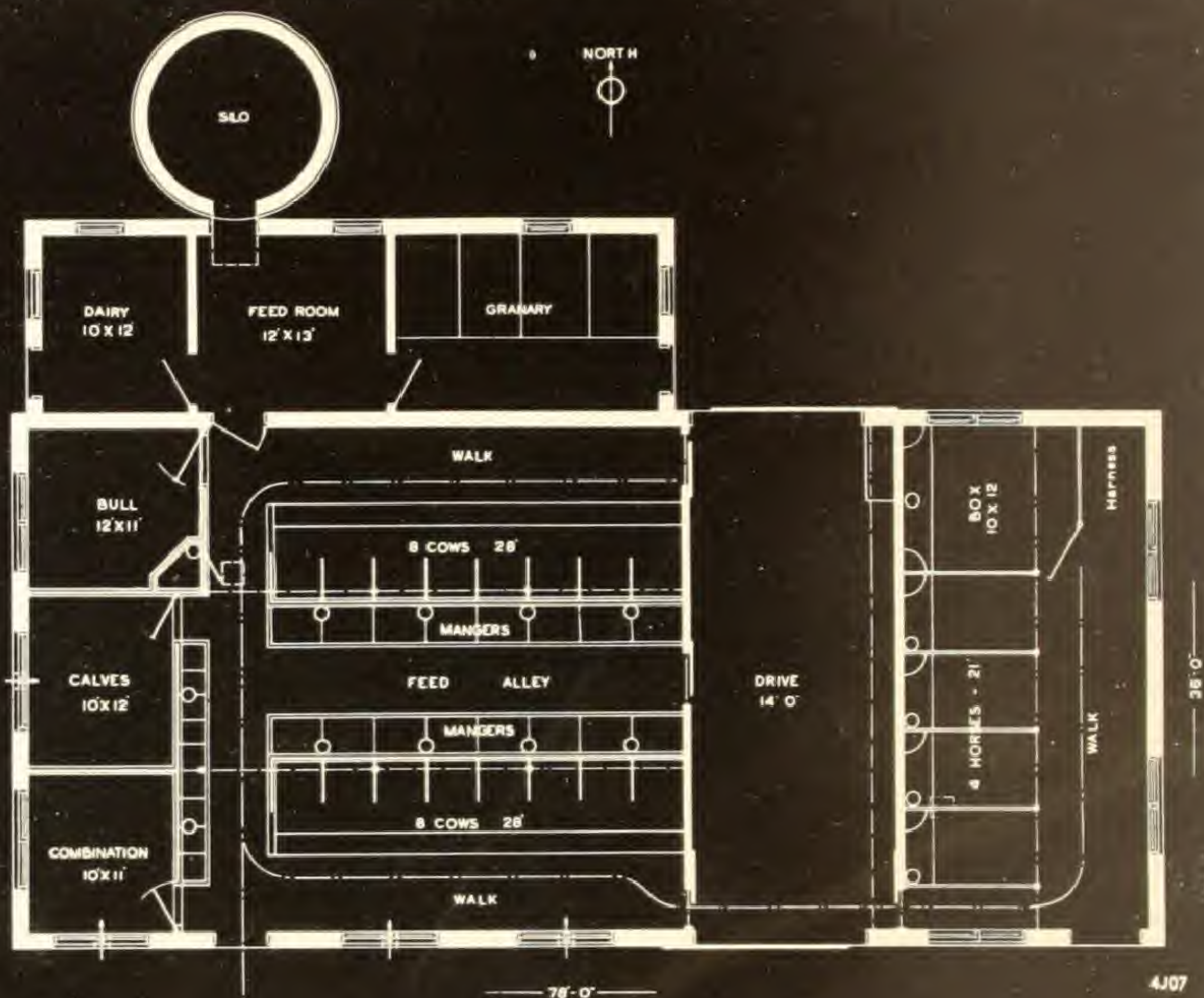


Planned with large pens for loose steer feeding

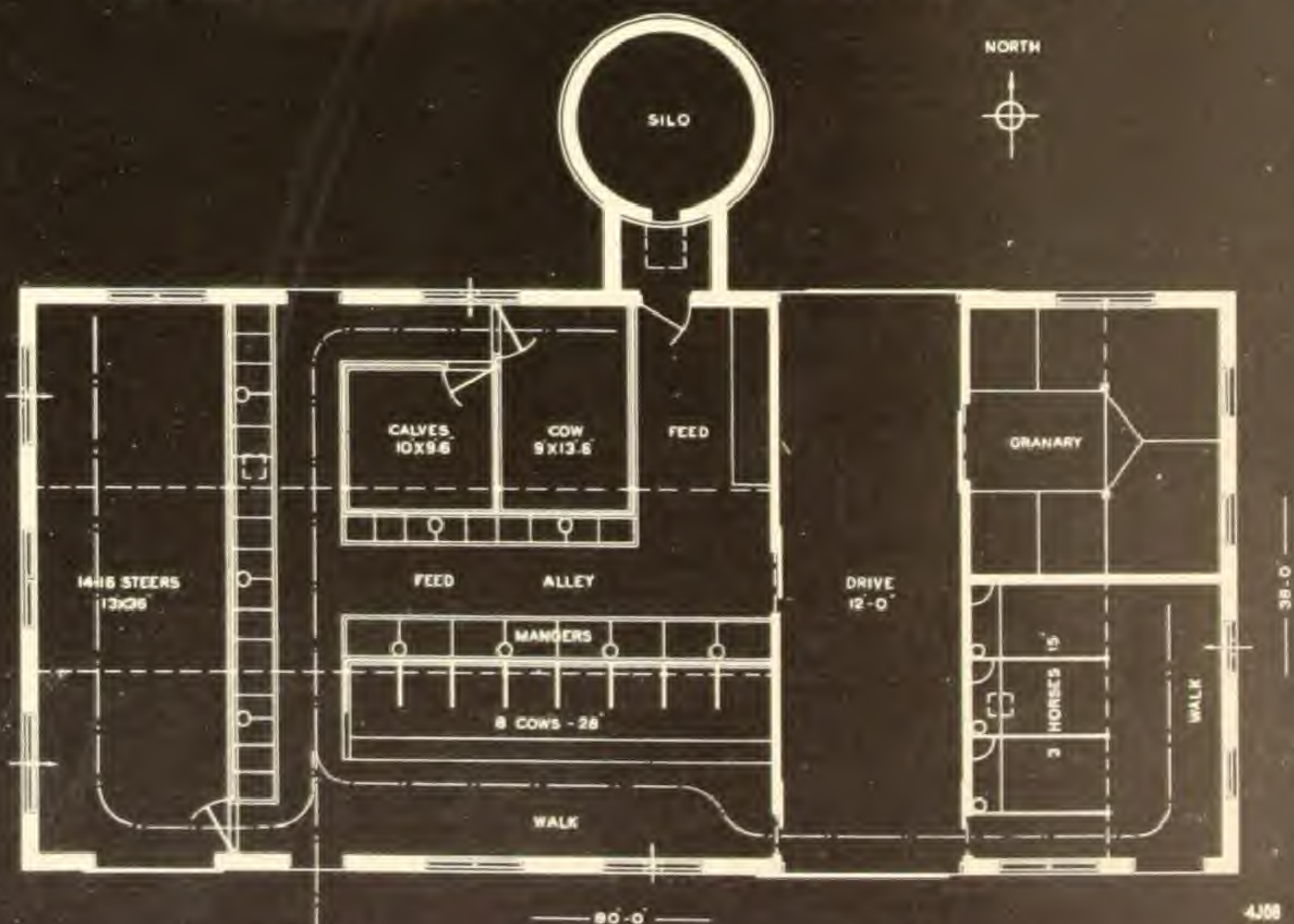


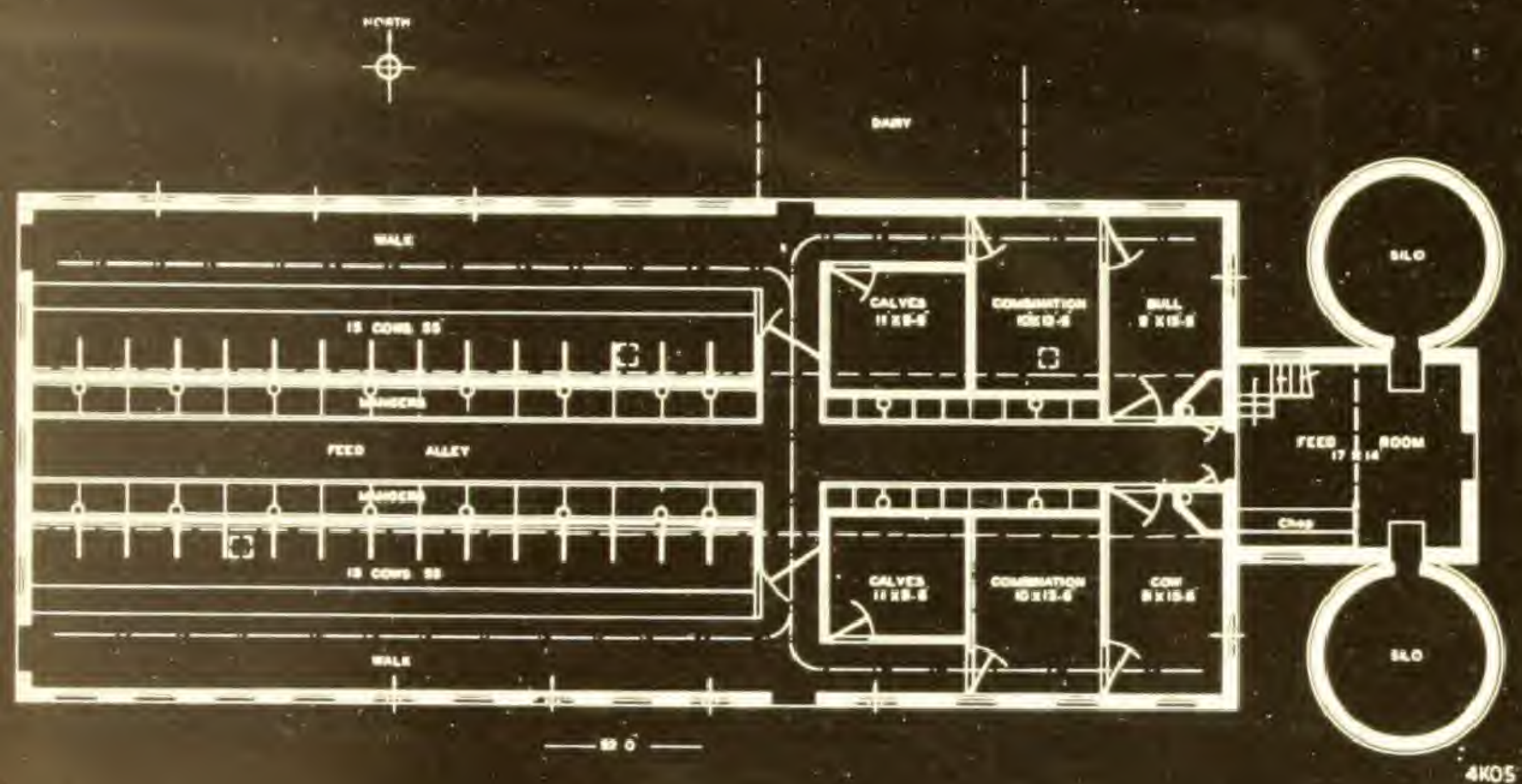
Stable floor plan for a 100-acre farm.





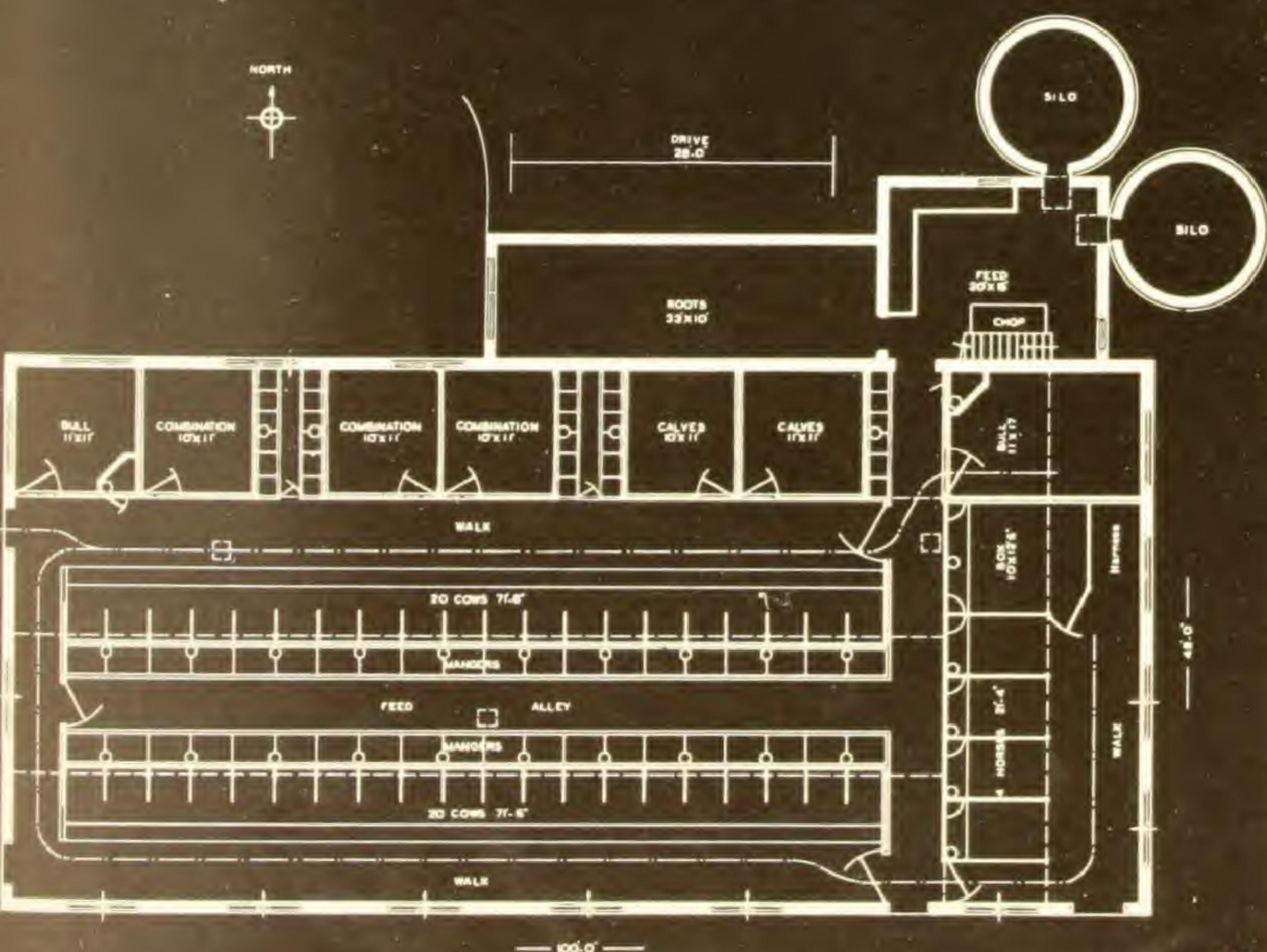
Barn with Ground Floor Drive, planned for mixed or dairy farming





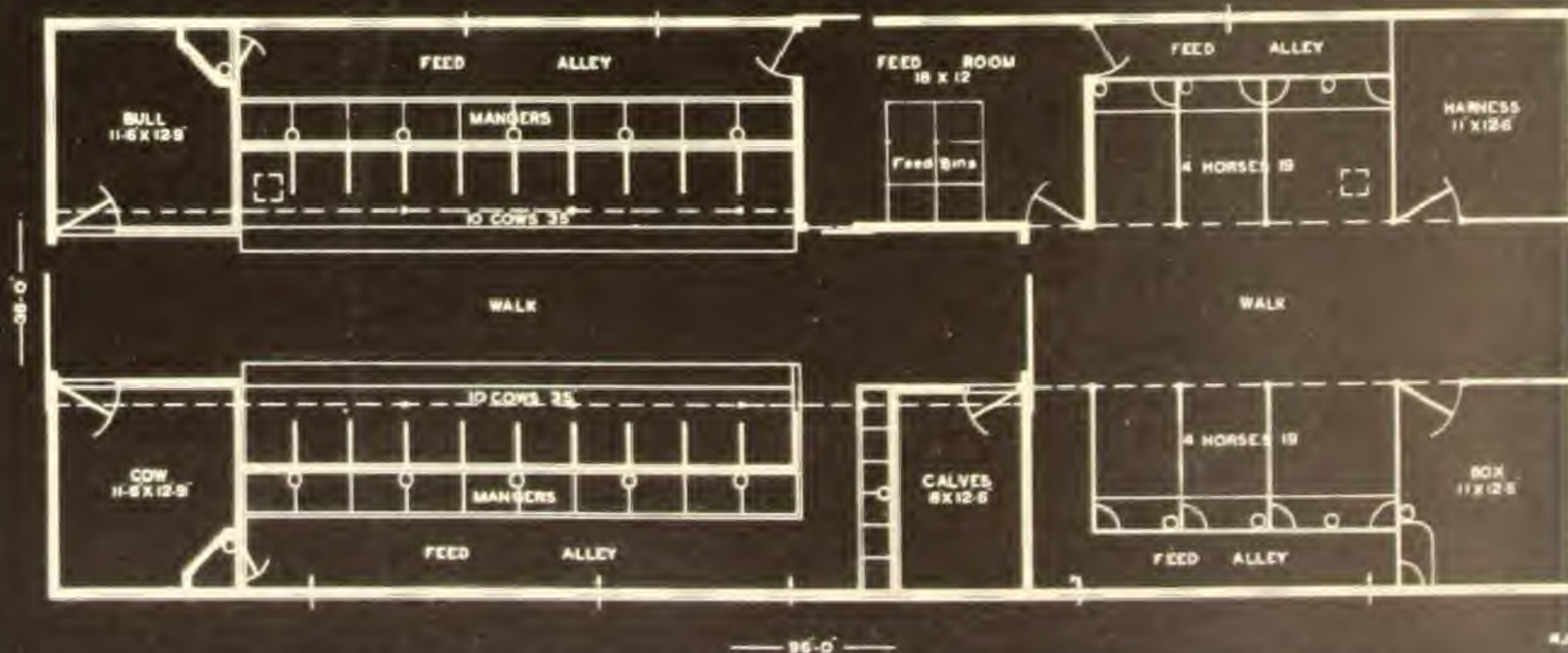
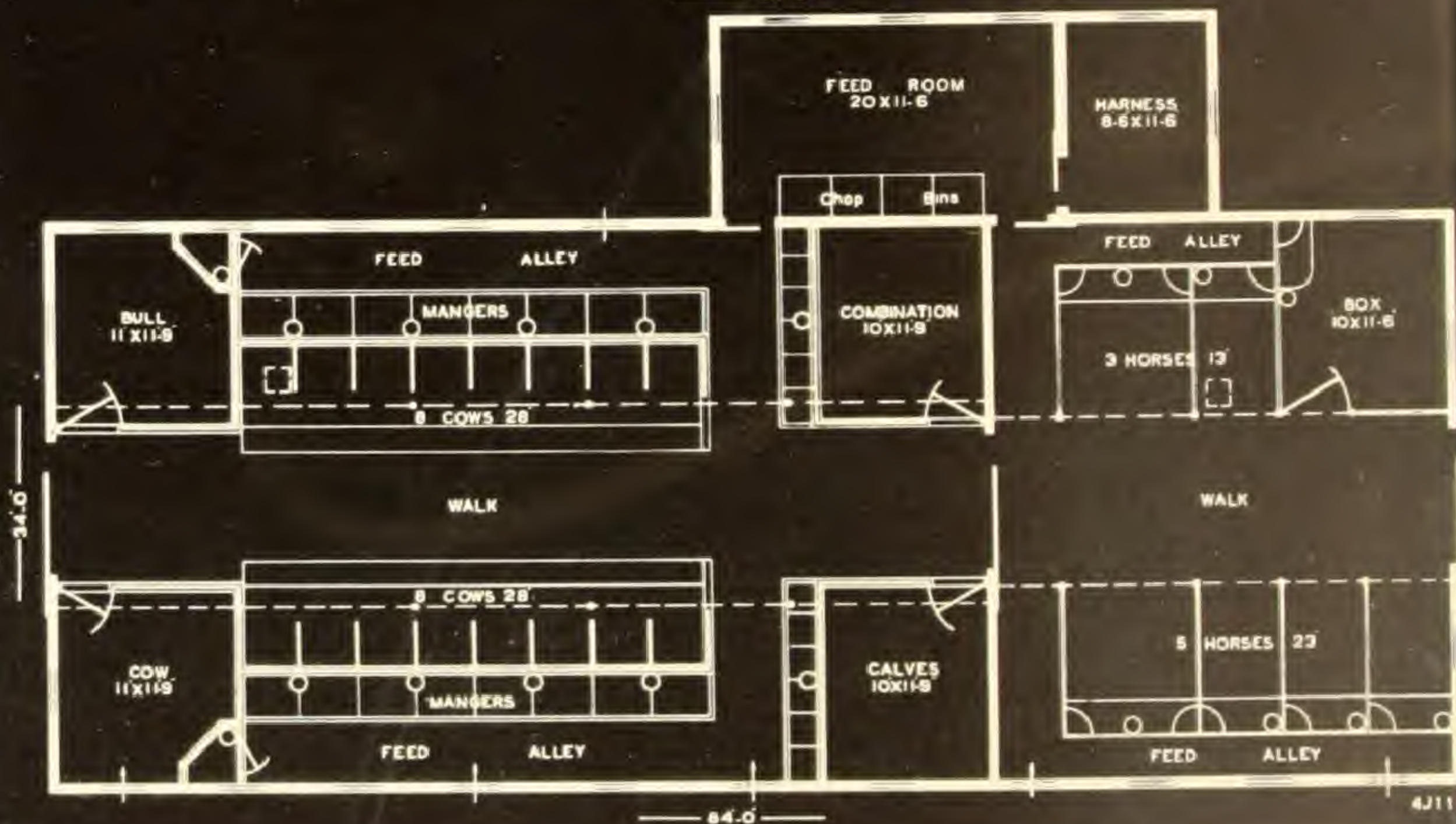
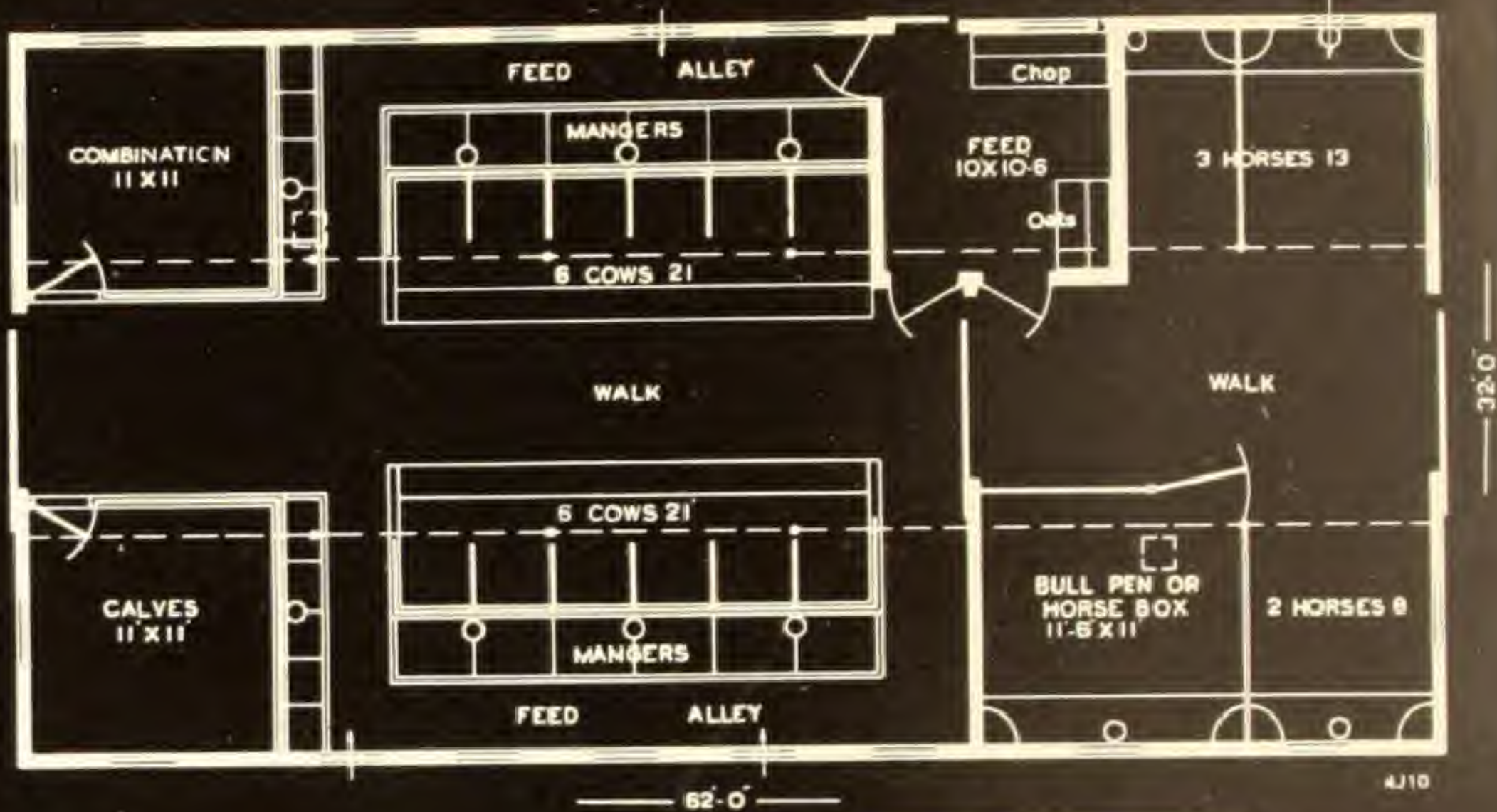
4K05

A good stable plan for dairy cows, economical and practical.

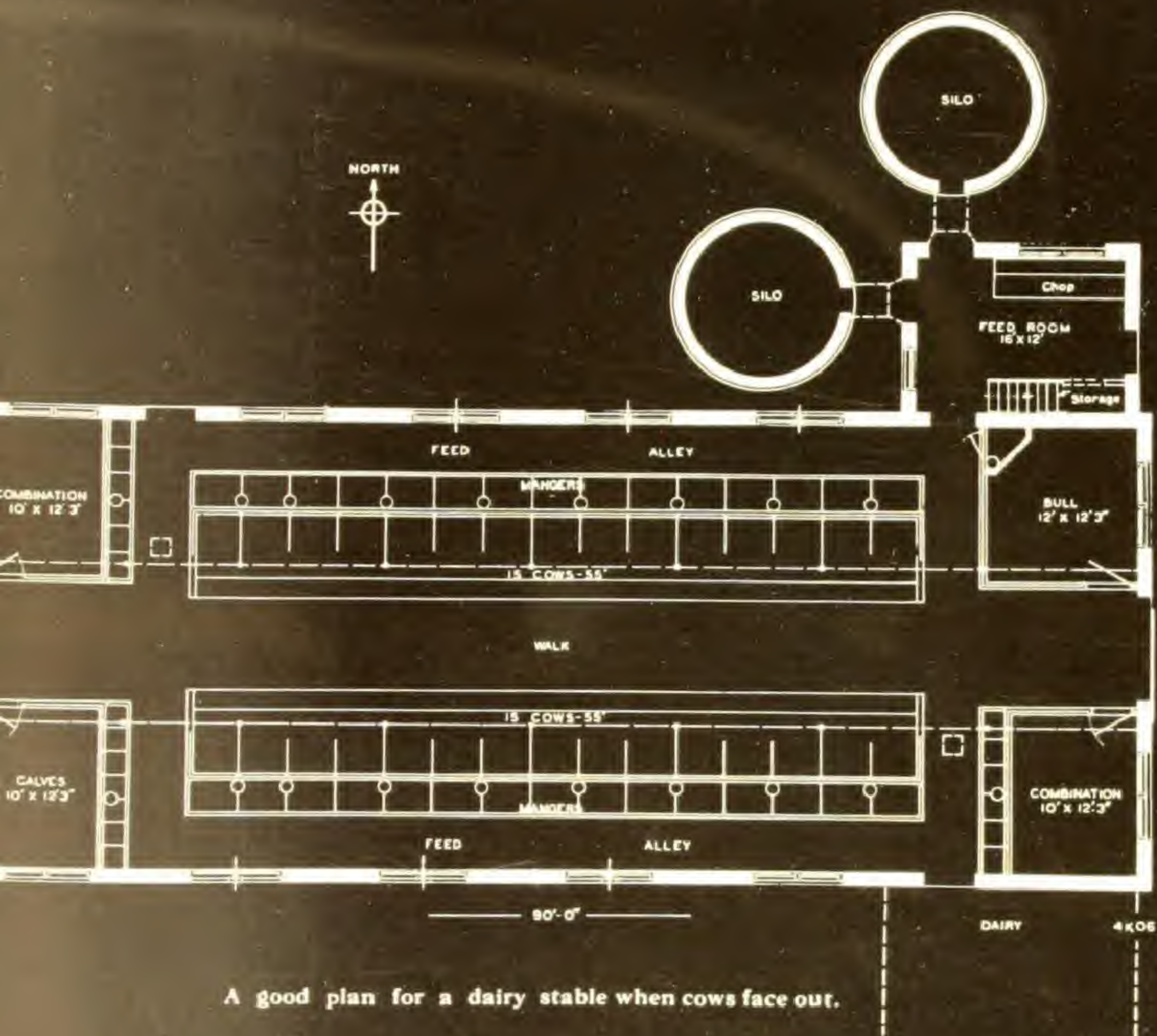


4J09

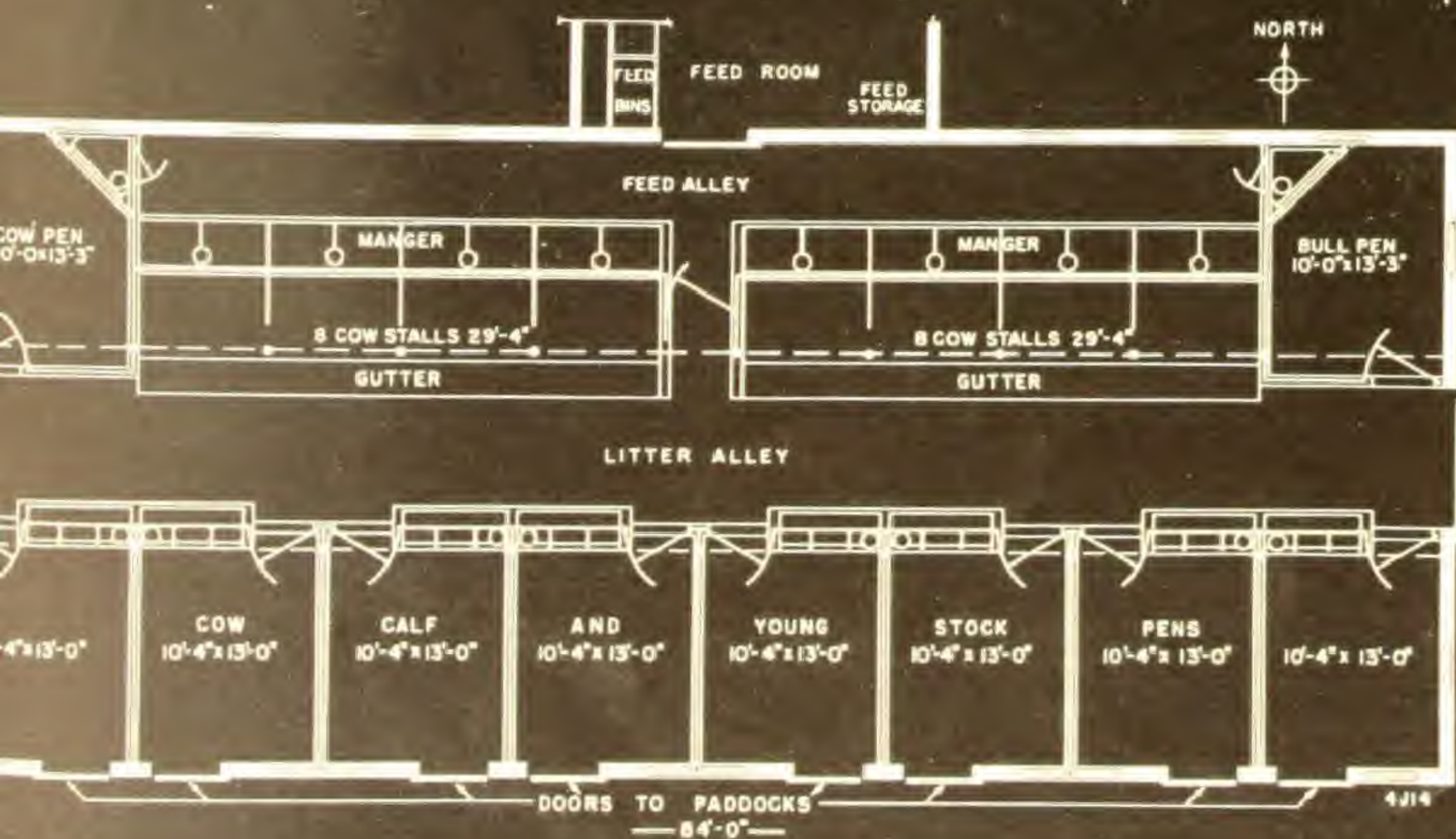
Planned for feeding, dairying, breeding and rearing young stock . . .
an all purpose plan, compact and economical.



GENERAL PURPOSE PLANS FOR THE PRAIRIE PROVINCES



A good plan for a dairy stable when cows face out.



Planned for Breeders of Beef Cattle, showing the stalls for nurse cows and pens for breeding stock. Note exit doors, pens to paddock.



Barns of the late R. J. Fleming, Donlands, near Toronto, Ont.



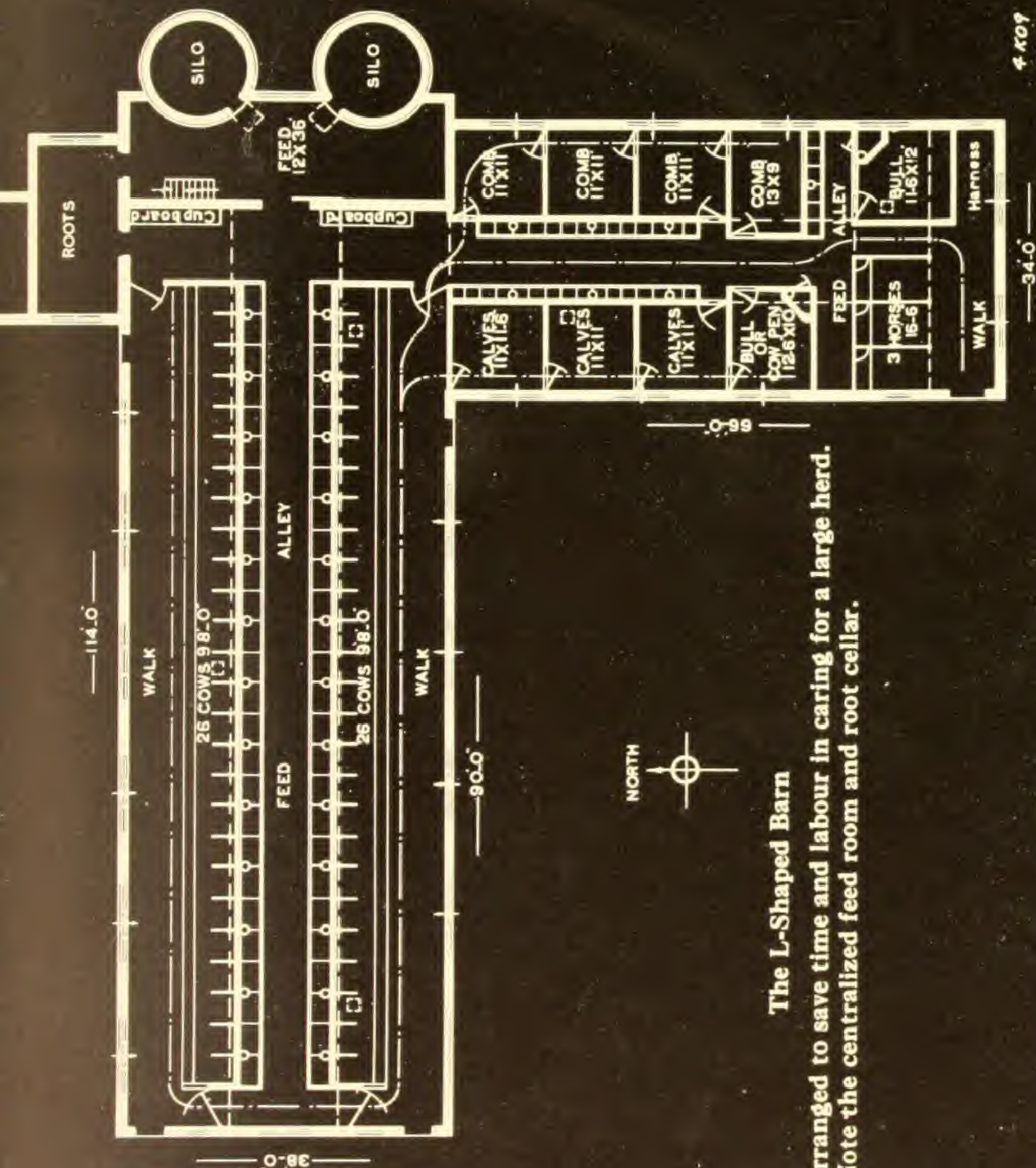
Barn of Truscott Bros., Sydenham, Ont.



Barn of Mr. E. S. Sibbick, Burford, Ont.



Barn of Mr. E. G. Langs, Preston, Ont.



The L-Shaped Barn

This plan is arranged to save time and labour in caring for a large herd.
Note the centralized feed room and root cellar.



Barn of Mr. E. S. Ireland, Troy, Ont.



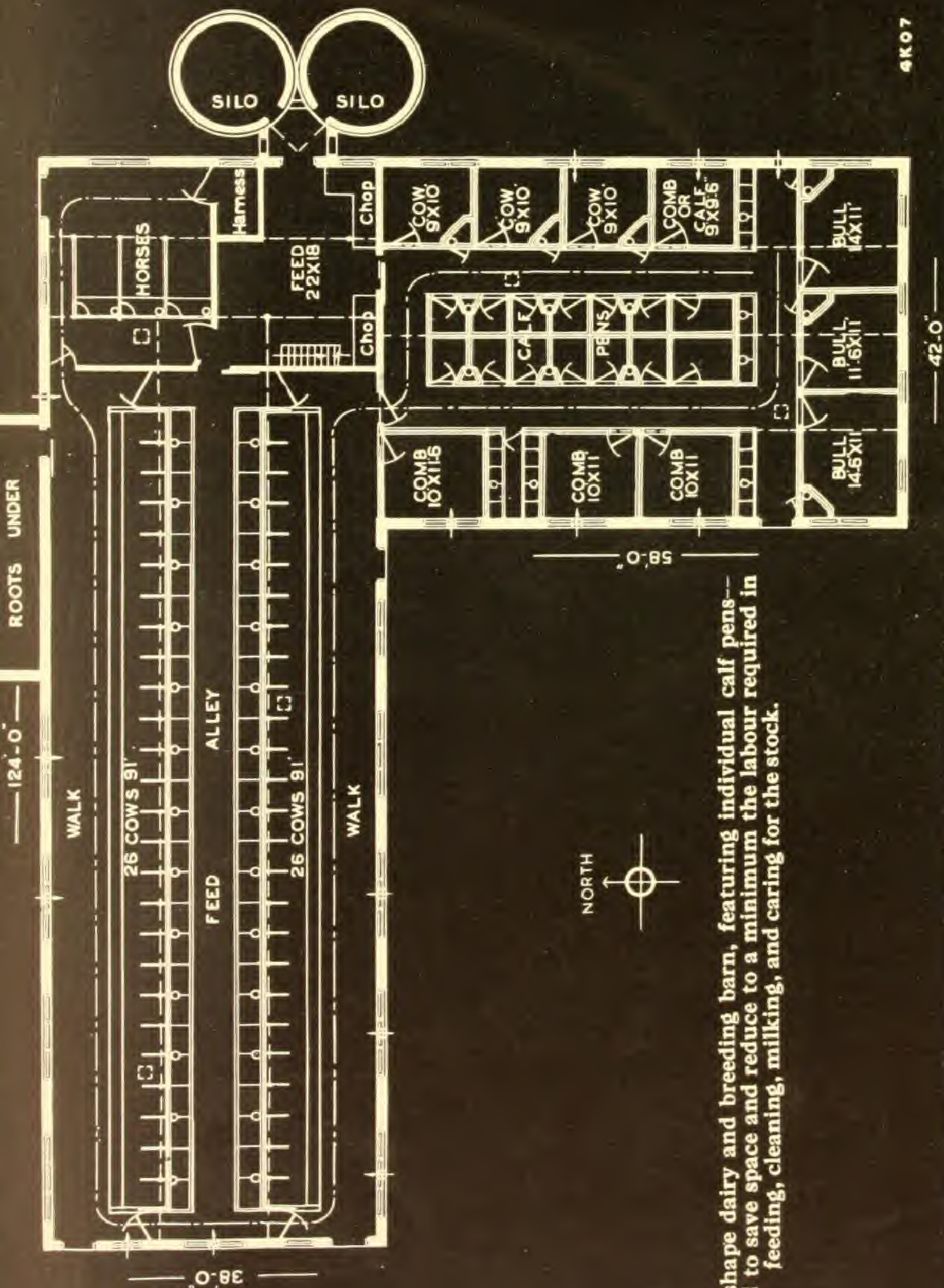
Barn at Wimbroke Farms, Weston, Ont.



Barn of Mr. E. A. Innes, Traillynd Farm, Brantford



Barn of Mr. Thos. Patrick, Ilderton, Ont.



An L-shape dairy and breeding barn, featuring individual calf pens-- planned to save space and reduce to a minimum the labour required in feeding, cleaning, milking, and caring for the stock.



One of four Beatty Equipped Barns of the late Mr. E. T. Stephens, Richmond Hill, Ont.



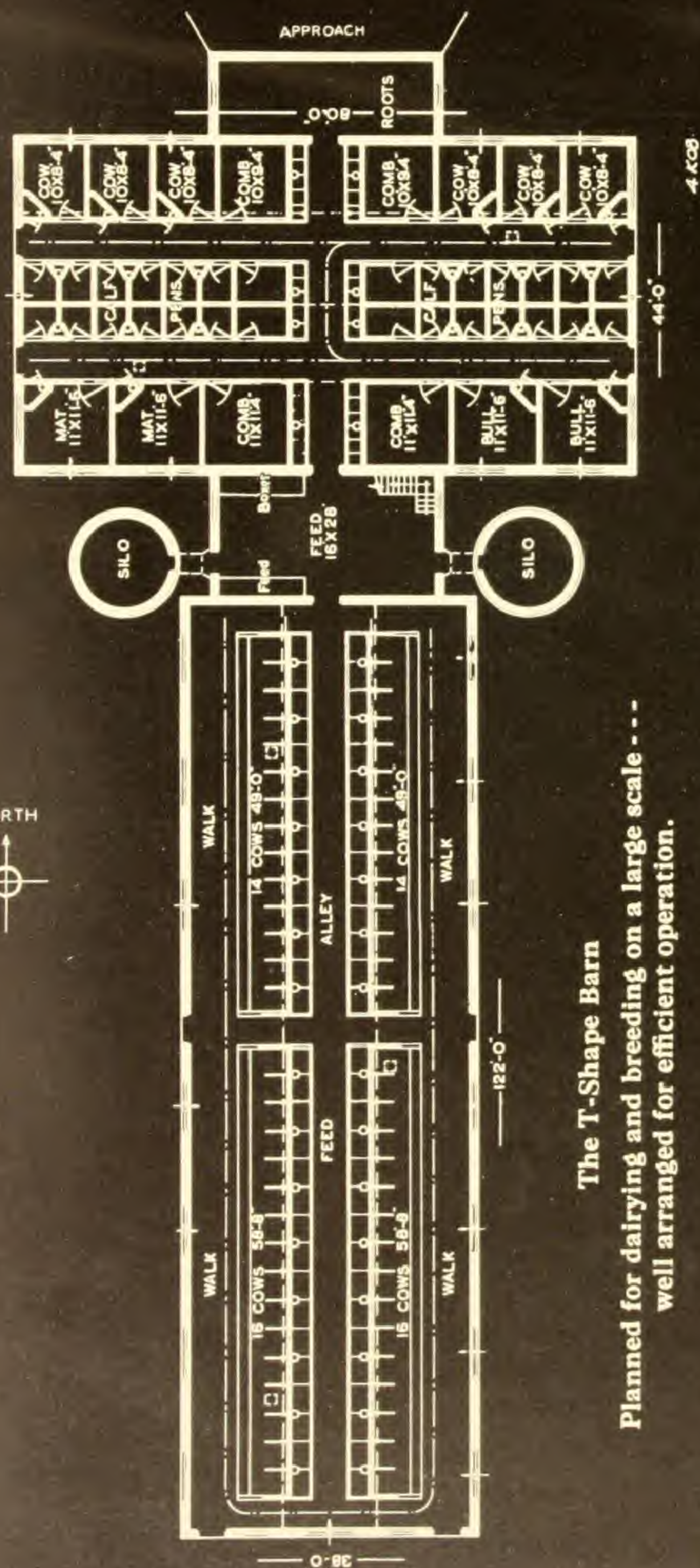
Barn on the farm of Norda Limited, Vankleek Hill, Ont.



Barn of Mr. M. Dell, Dell's Dairy, Niagara Falls, Ont.



Barn at Medovista Farms, Cloverdale, B.C.



The T-Shape Barn

Planned for dairying and breeding on a large scale ---
well arranged for efficient operation.



Horse Barn, City of Port Arthur, Beatty Equipped.



No. 5 Police Station, Toronto.



Stable of Weston Dairy, Weston, Ont.



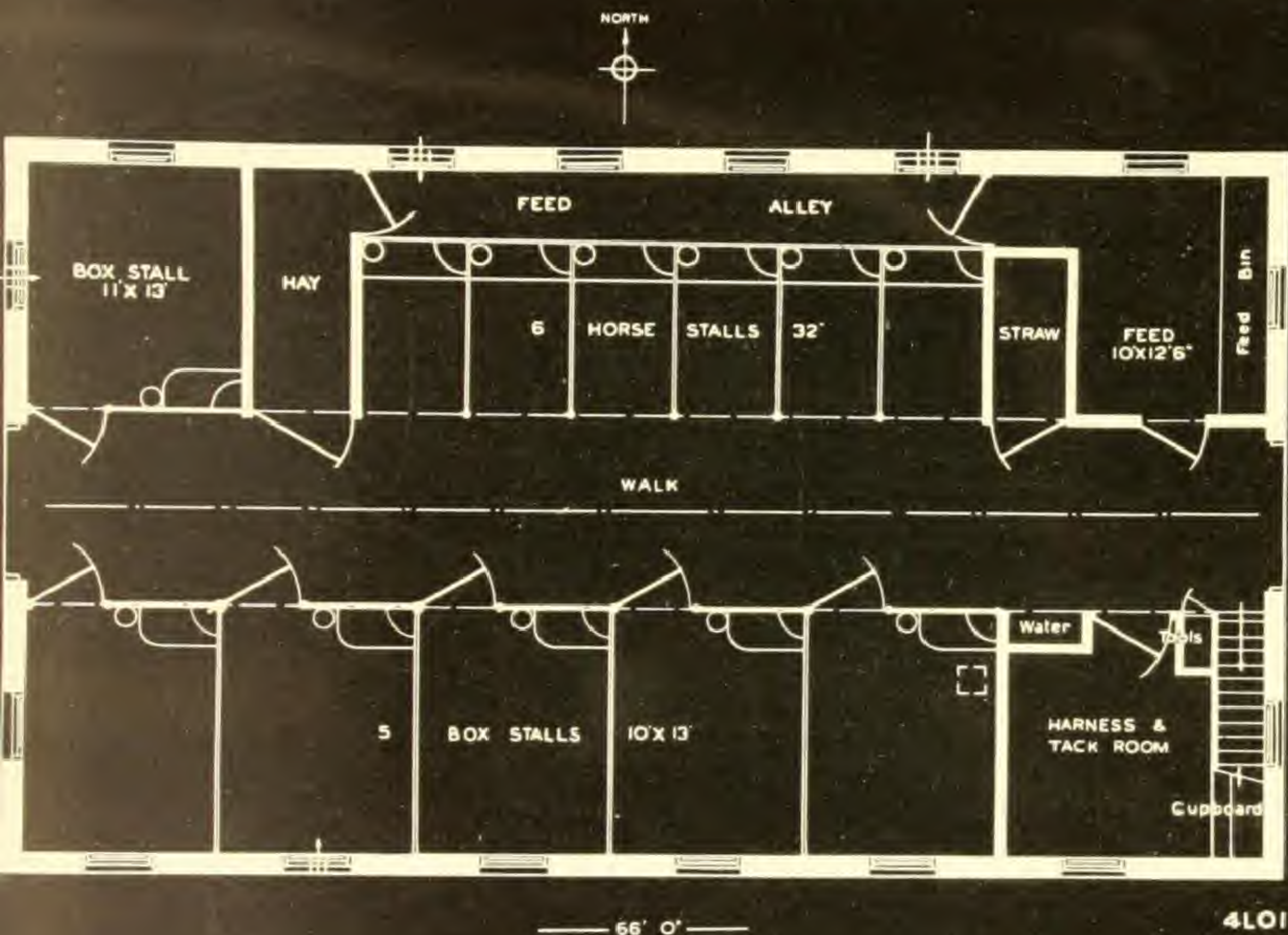
Horse Barn at Rideau Dairy Farm, Ottawa



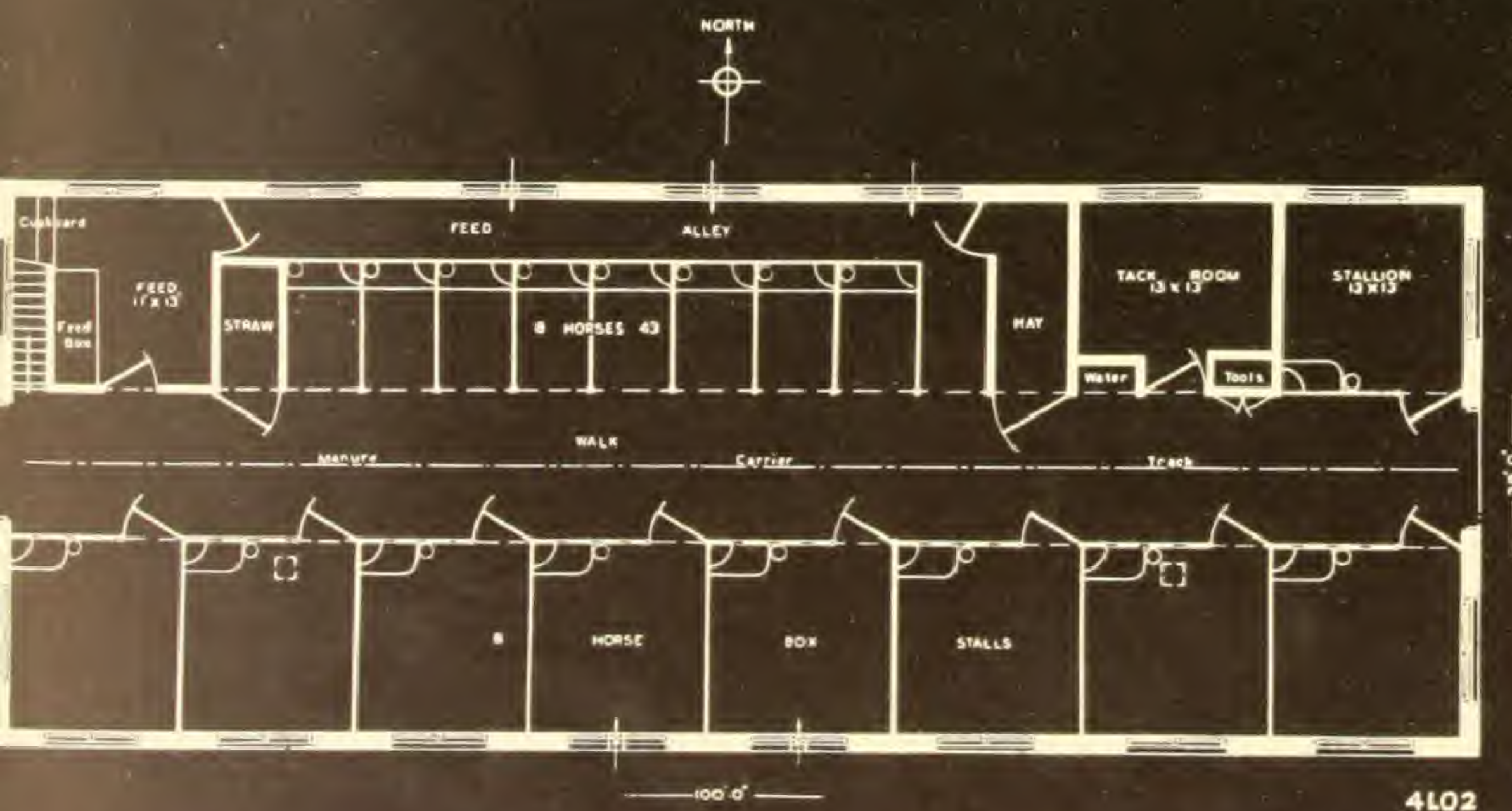
Stable of Standard Bread Co. Ottawa, Ont.



City Incinerator Stable, Montreal, Que.



A typical horse stable plan



Planned for stabling horses on a larger scale. The plans above can be arranged with two rows of standing stalls or two rows of box stalls.



**Piggery, Normadale Farms Limited,
London, Ont.**



Piggery at Foxhaven Farm, Niagara Falls, Ont.



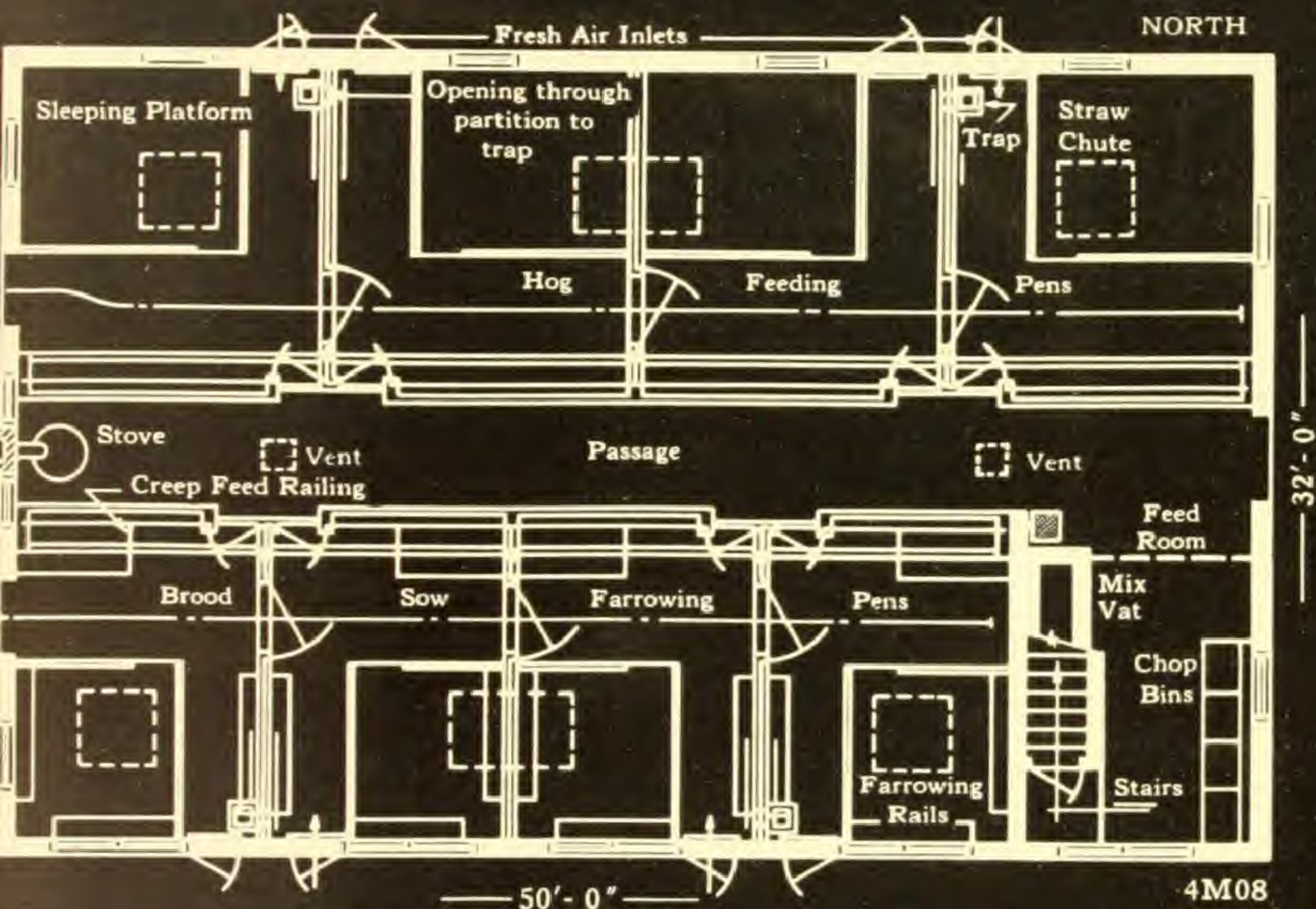
Piggery, Leitchcroft Farms, Experimental Farm of Master Feeds, Gormley, Ont.



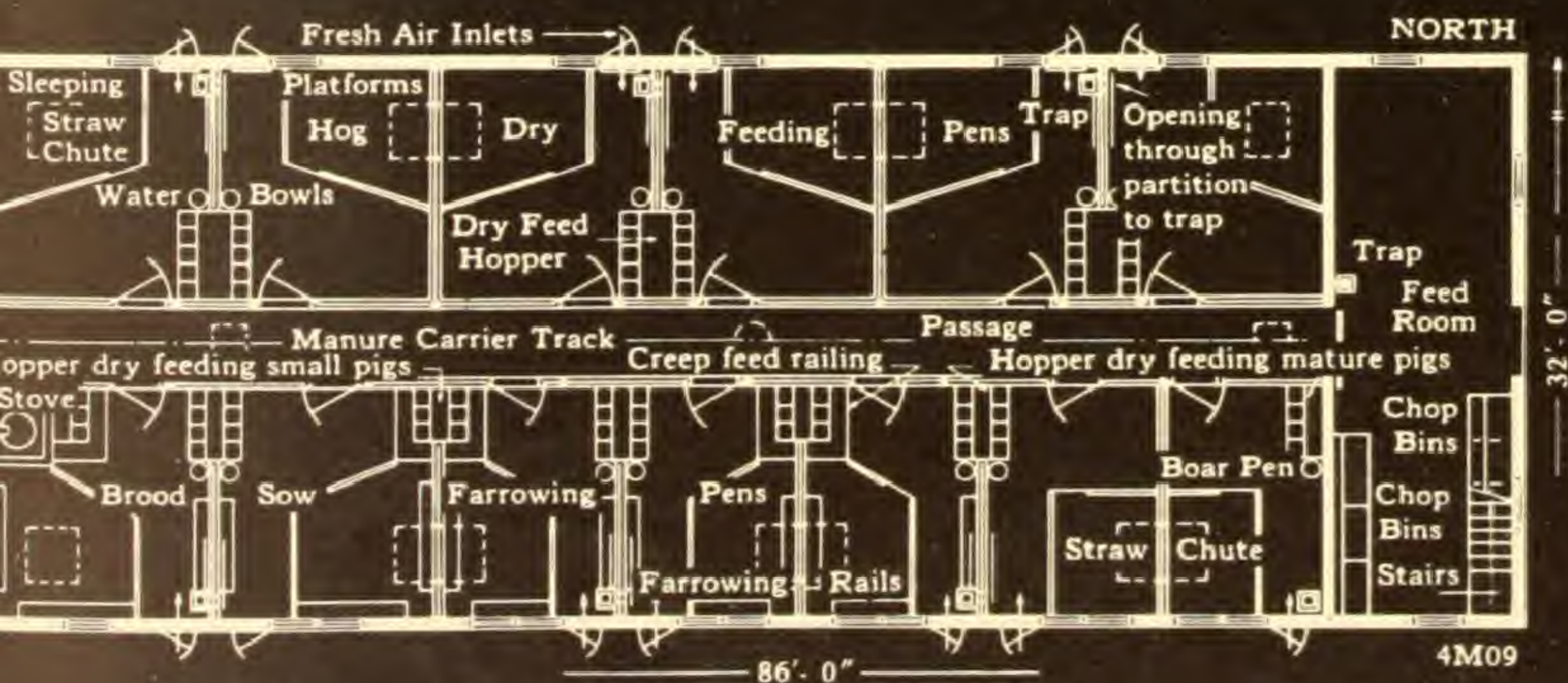
Piggery of Mr. Allan McLean, Fergus, Ont.



**Farm Piggery at Brescia Hall,
London, Ont.**



Floor plan of hog house for breeding and feeding, showing trough for wet feed, accommodates 50 to 60 hogs.



Floor plan of hog house for breeding and feeding, showing hoppers for dry feed. Accommodation for 100 to 120 hogs.



Piggery at Farm of Dr. W. R. Ballard, (Animal Foods) Toronto, Ont.



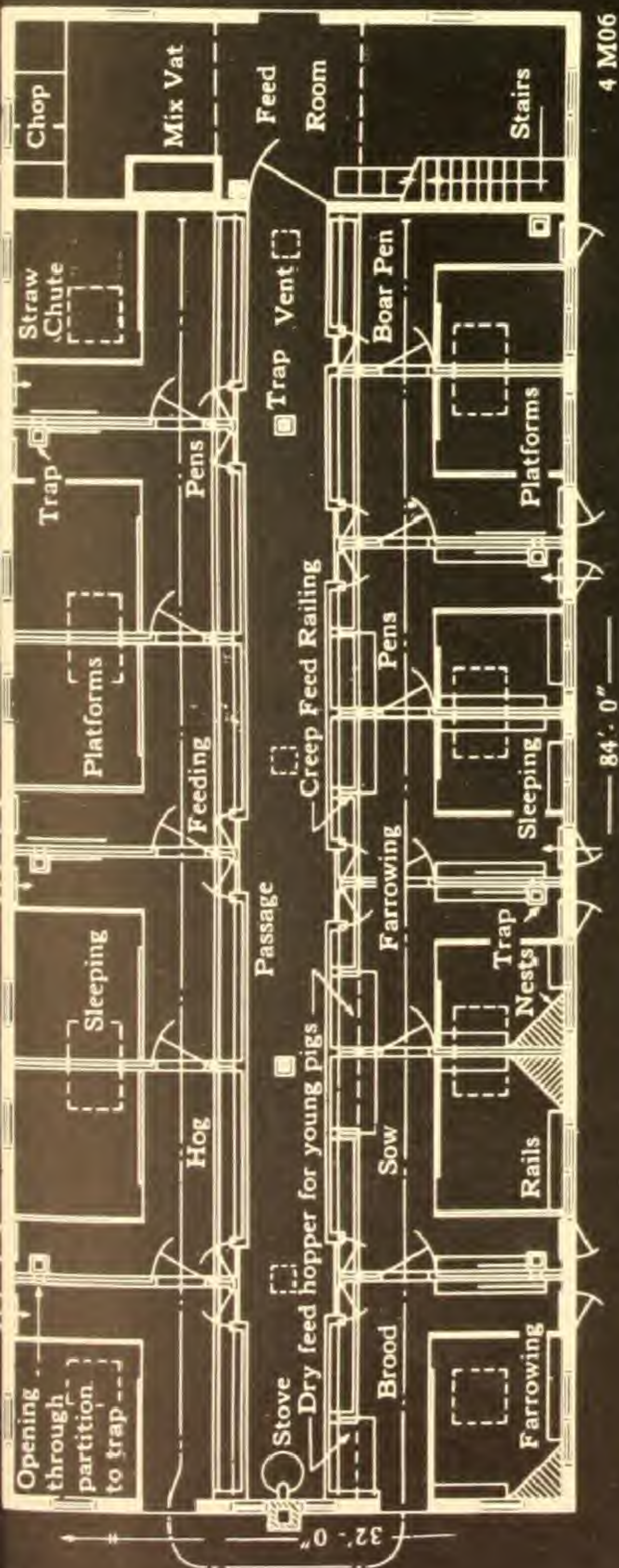
Piggery at Stevenson Farms, Erected by the late Mr. T. P. Loblaw, Alliston, Ont.



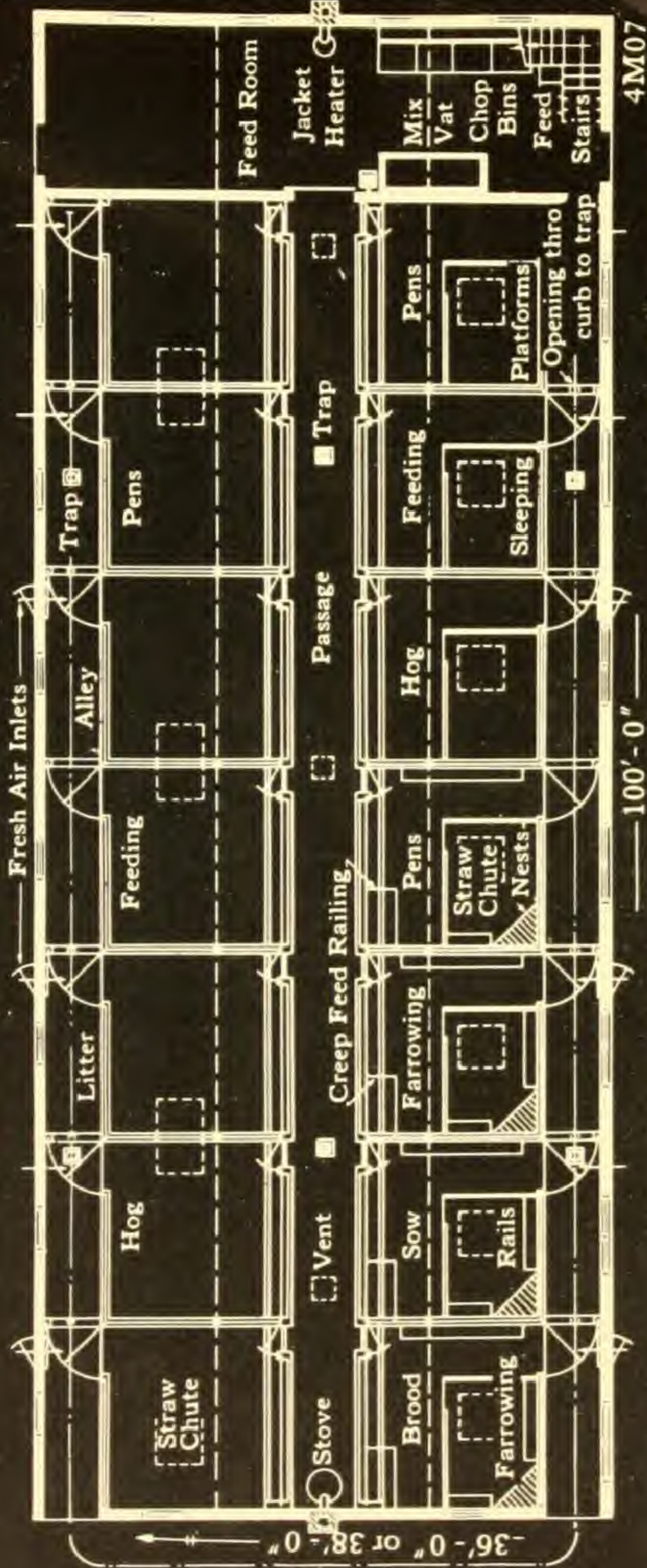
Piggery at the Farm of Mrs P. F. Potters, Langton, Ont.



Piggery at Ardmore Farm, J. Godfrey Smith & Son, Elora, Ont.



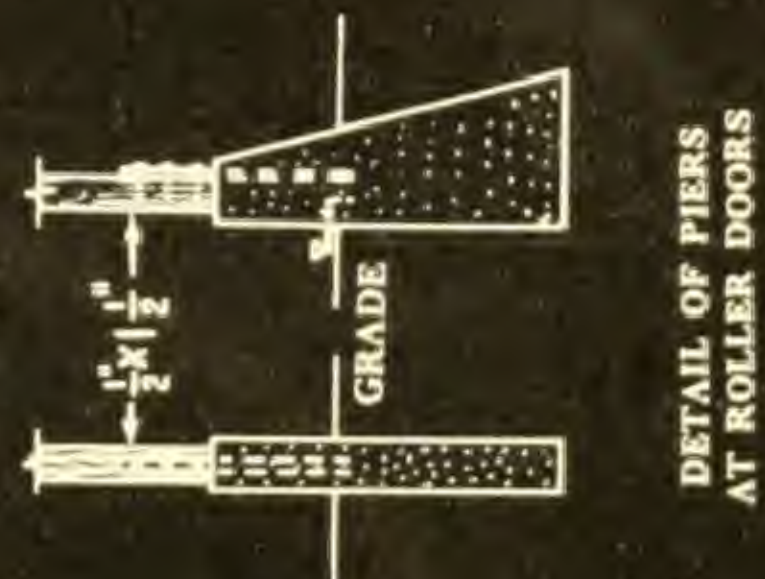
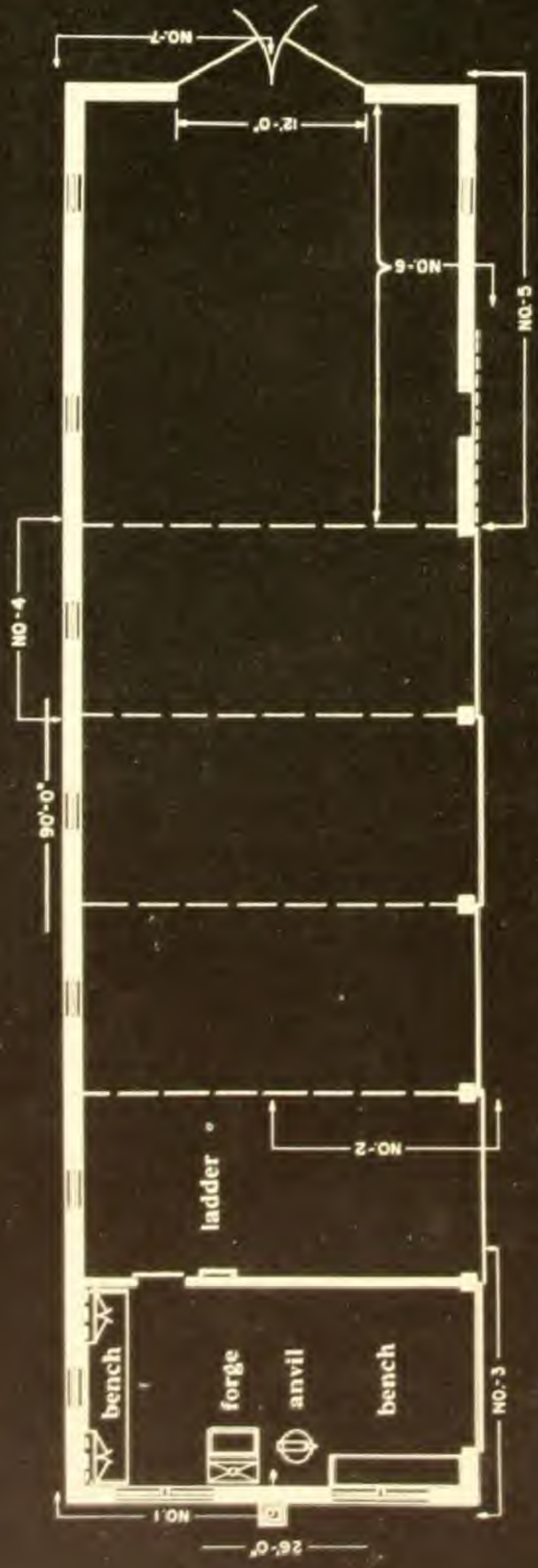
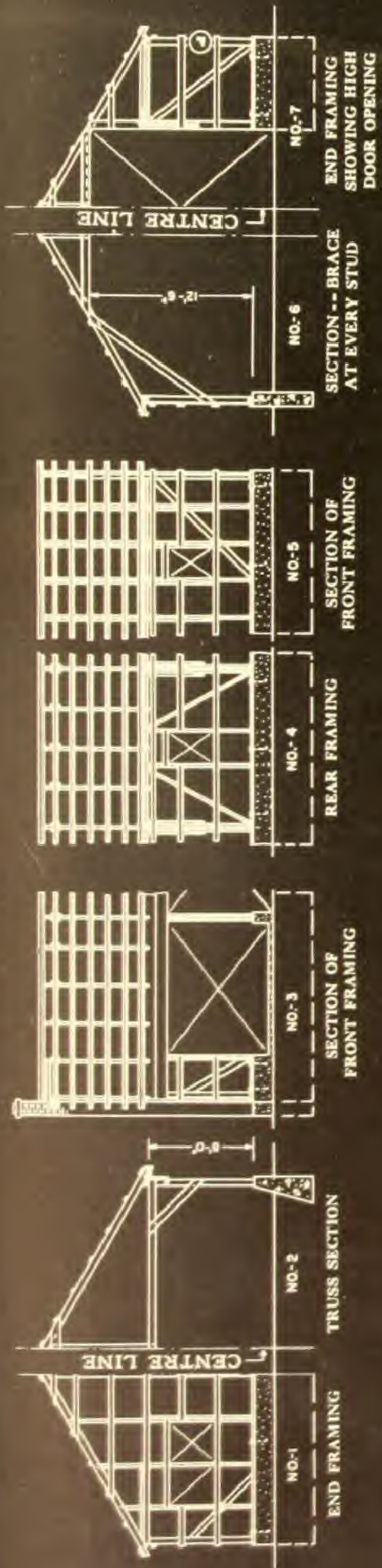
Floor plan of hog house for breeding and feeding, showing combination dry and wet feeding. Accommodation 90 to 100 hogs.



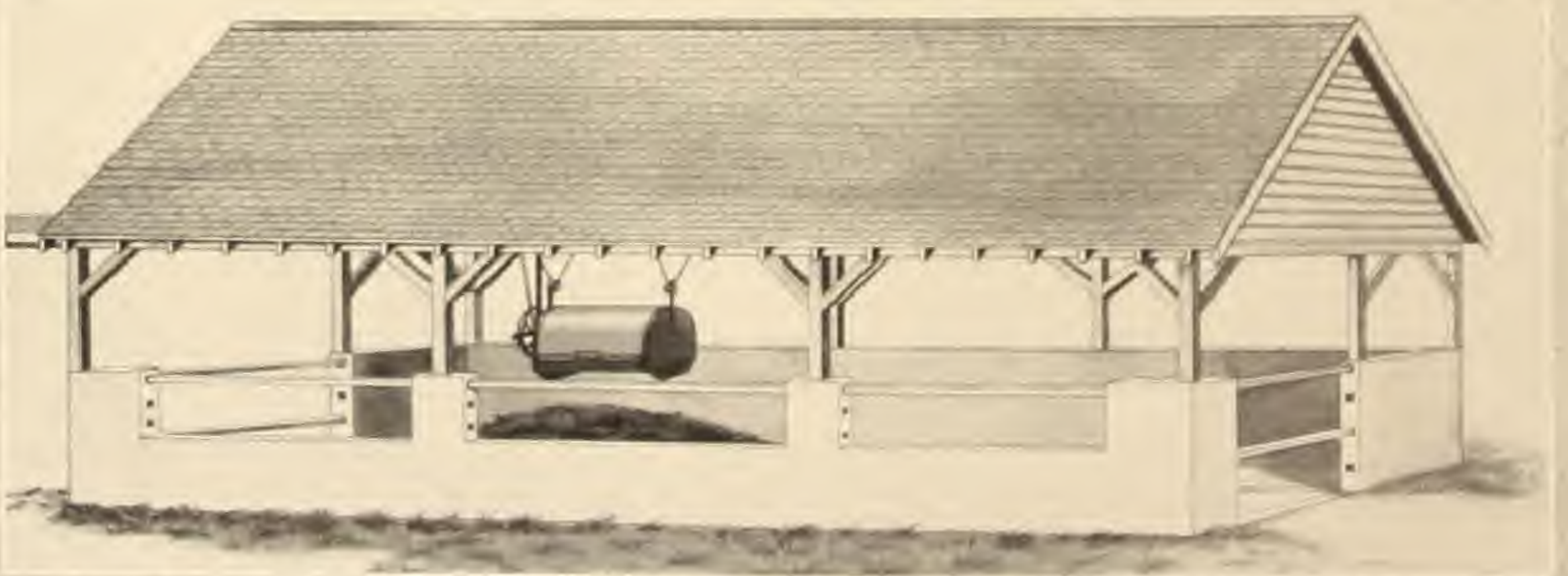
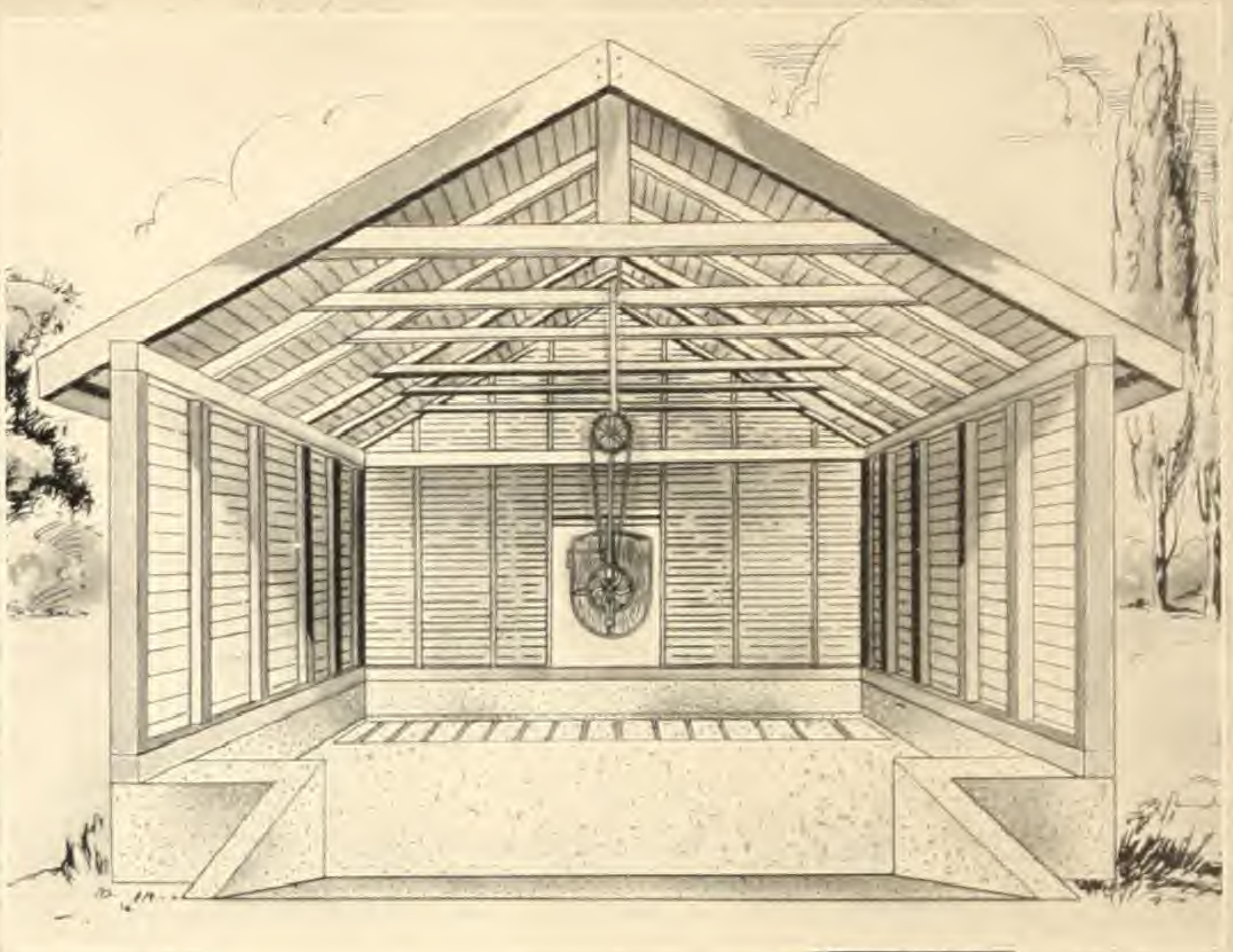
Floor plan of hog house, showing troughs for wet feeding and rear litter alley. Accommodation 150 hogs.

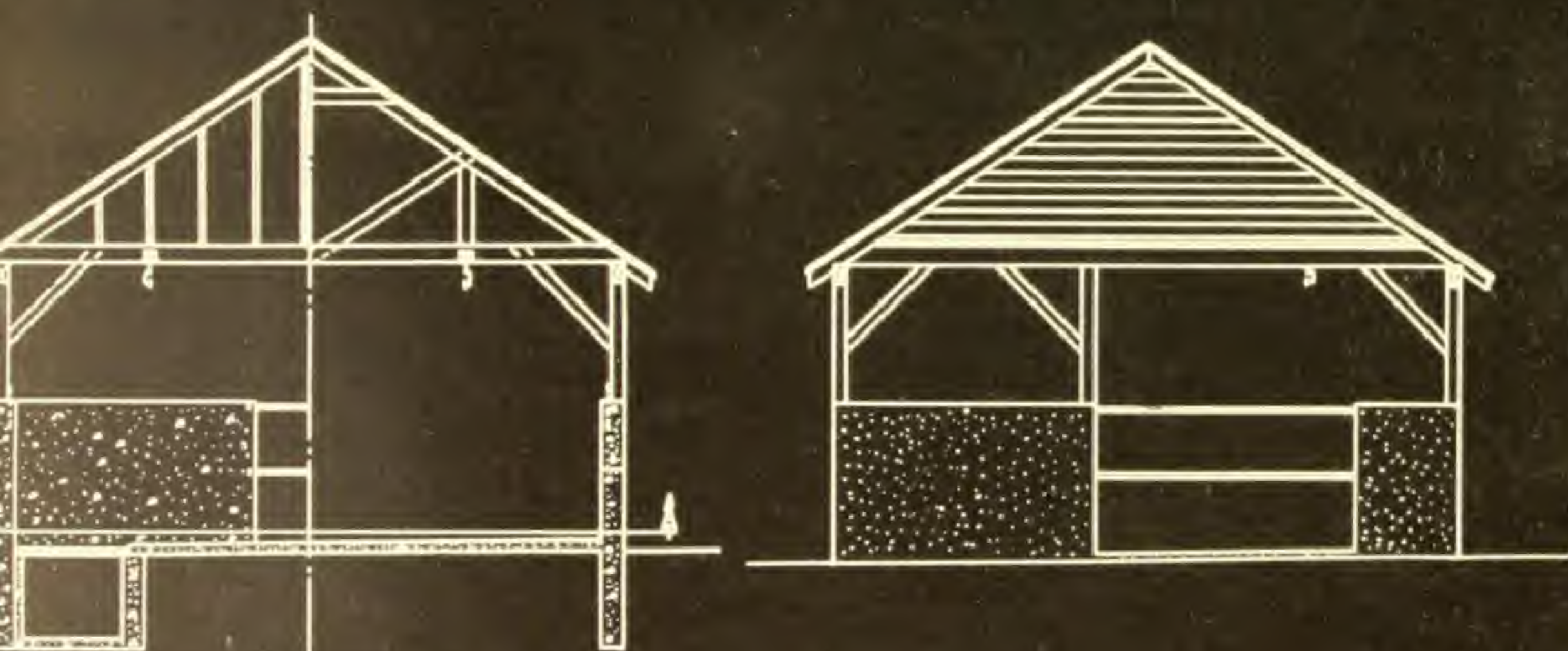
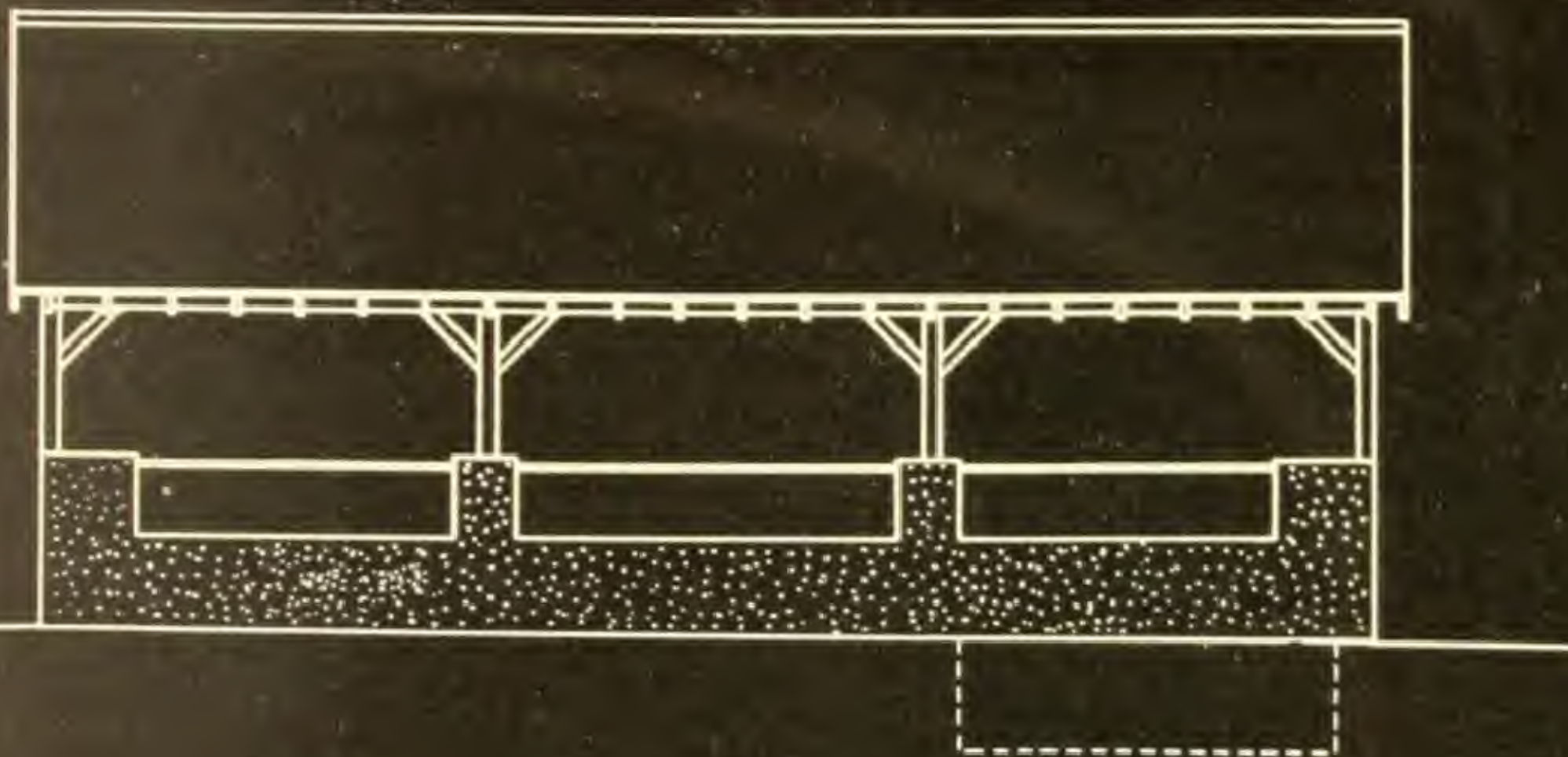


Typical Implement Sheds illustrating roller doors travelling on two Beatty parallel Barn Door Tracks. Track is supported with double brackets. Doors are suspended on Beatty adjustable four-wheel roller bearing hangers.



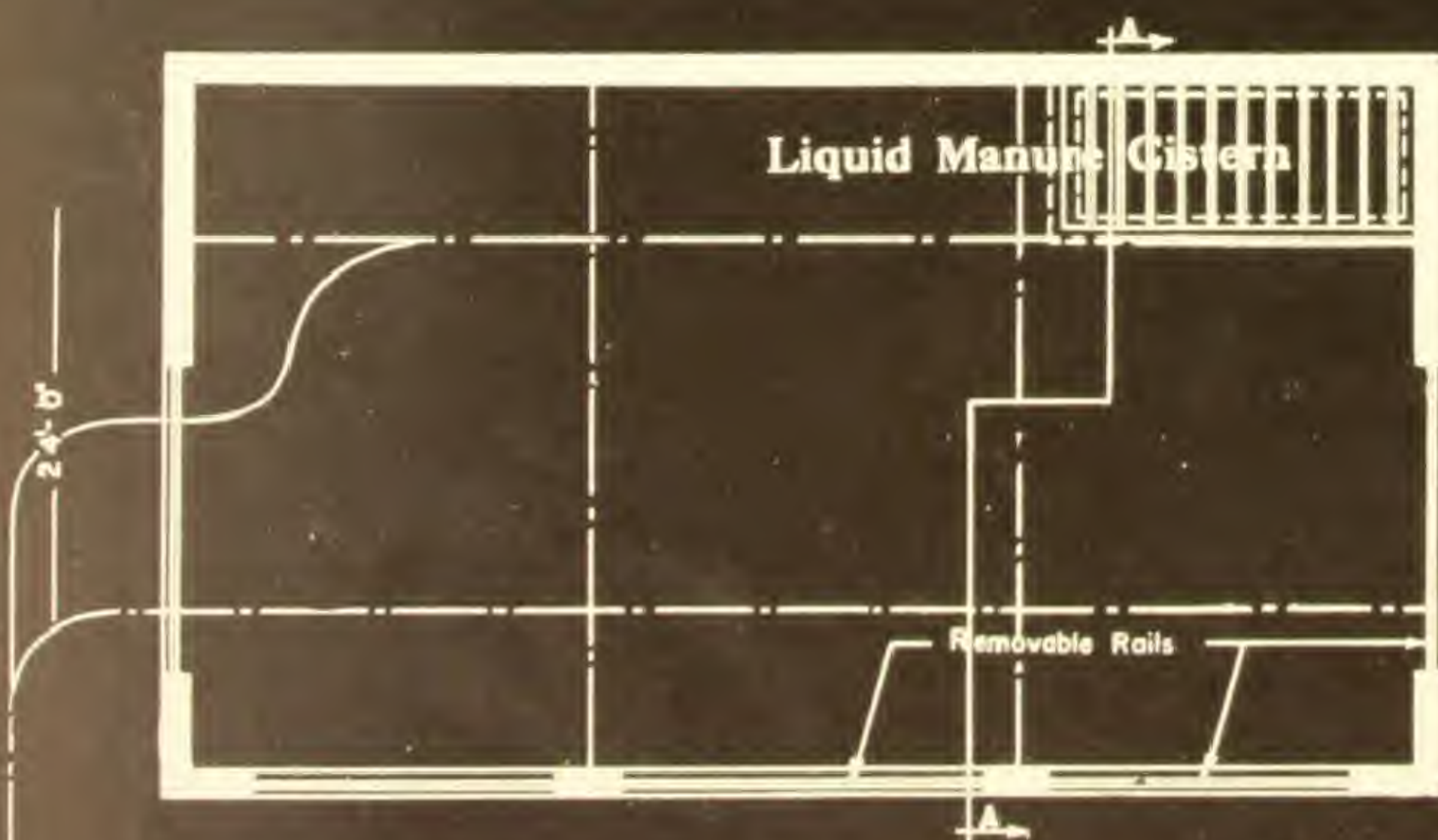
PLAN OF MODERN WORK SHOP AND IMPLEMENT SHED





↑ Liquid Manure Cistern

42'-0"

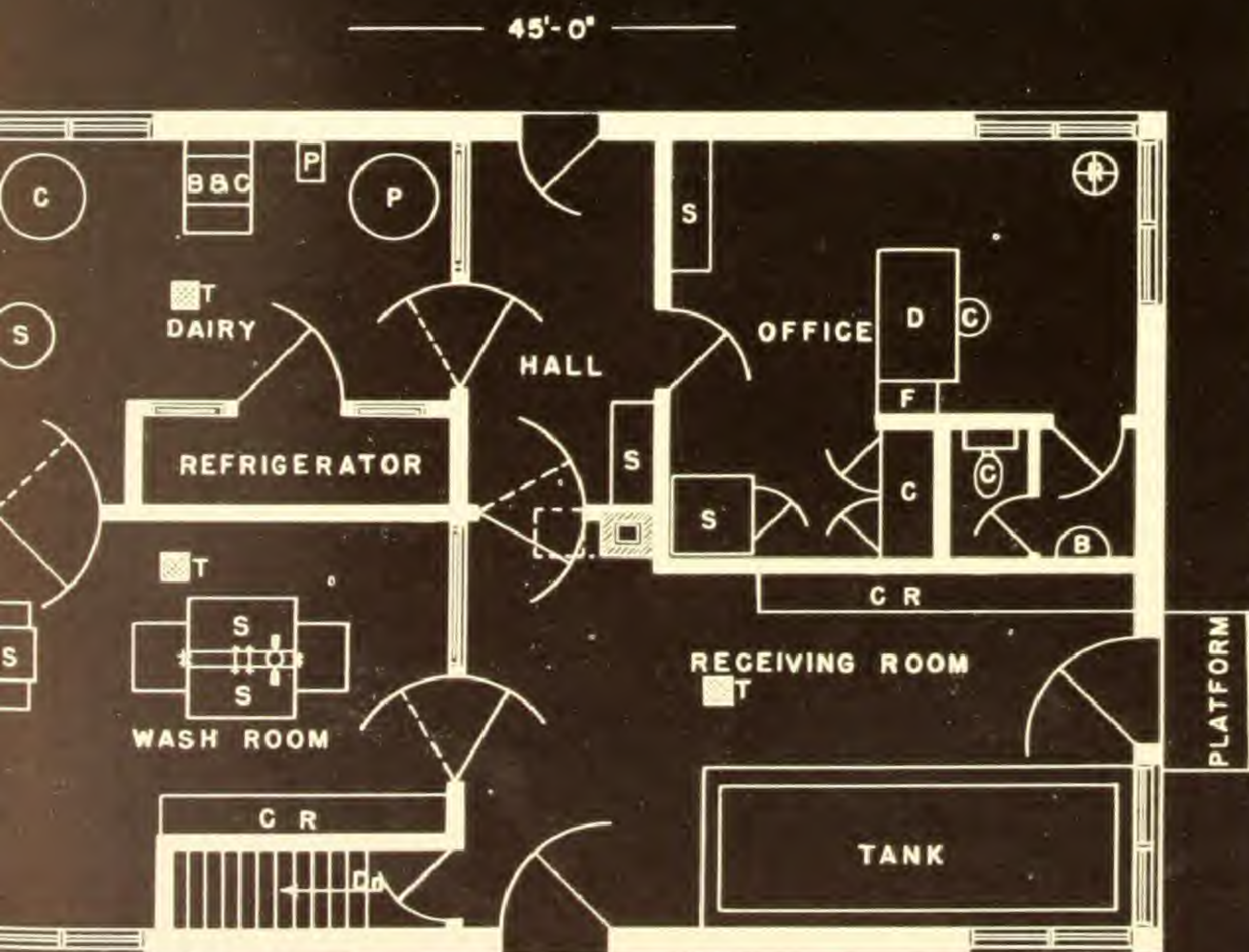


SAVE WASTE OF VALUABLE MANURE FERTILITY



TYPICAL FARM DAIRIES





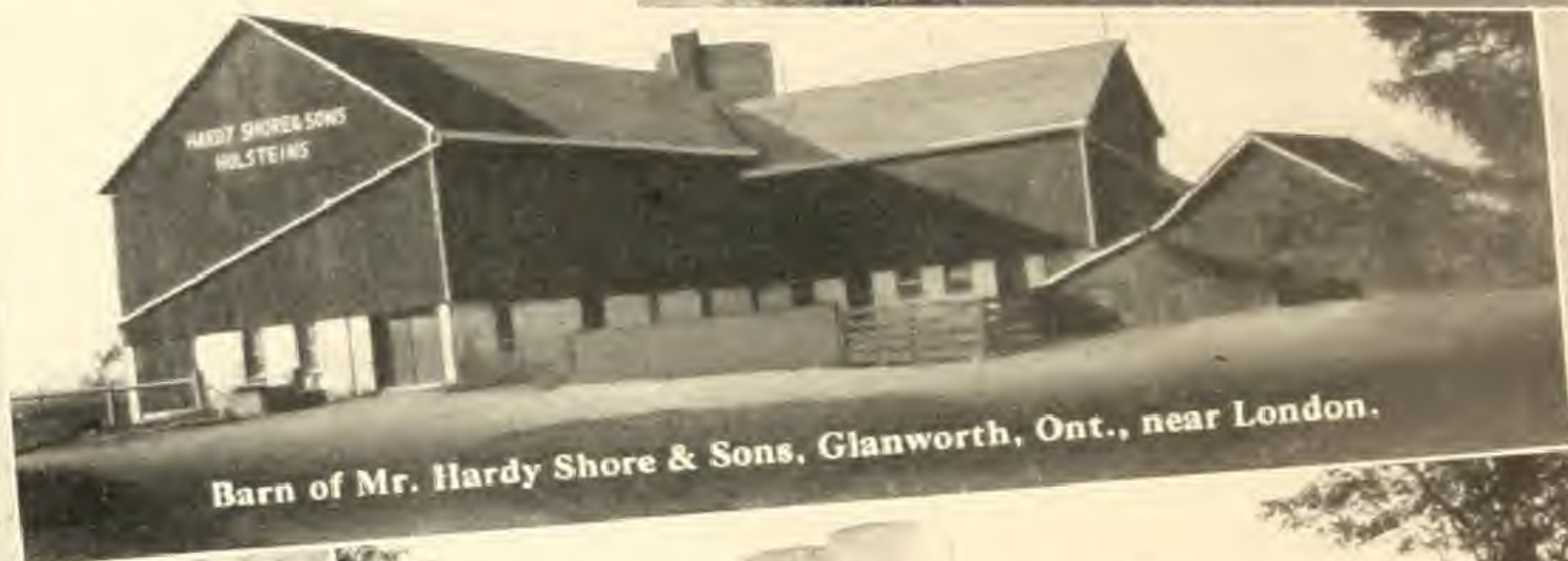
Three Dairy Plans

RECLAIMED BARN

Do not waste those strong old timbers and substantial masonry walls. Keep them sound. The cost of replacement is high.



The Old Barn



Barn of Mr. Hardy Shore & Sons, Glanworth, Ont., near London.



Barn of Mr. Reginald B. Woodley, Wilsonville, Ont., near Brantford.



Barn of Mr. J. M. Howse & Son, Aylmer, Ont.

Repair the old barn before it is too late. It can be made as good or better than new at less than half the cost of a new barn of equal capacity.



Barn of Mr. Howard A. Nelles, Boston, Ont., near Brantford.



The Old Barn

The old barn is seldom hopeless. There is pleasure and satisfaction in reclaiming it for future generations. Ask the experienced Beatty man to help.

The sturdy barns of fine appearance here shown were reclaimed from the old by their owners.



Barn of Mr. Alston Campbell, Burford, Ont.



Barn of Mr. S. G. Bennett, Georgetown, Ont.

The stables were made efficient and profitable through the installation of modern labour-saving steel stable equipment. The cost was less than building new barns. These illustrations indicate how well old barns can be remodelled.



Barn of Don Mills Farms Limited, Goddard, Ont.



Barn at Weldwood, The Farmer's Advocate Farm, London, Ont.

OLD BARNs

R E C L A I M E D



Barn of Mr. J. Geoffrey Smith & Son, Ardmore Farm, Elora, Ont.

These barns were re-claimed at moderate cost, through a sound investment that is permanent and profitable.



Barn of Edwards Bros., Watford, Ont.



Barn of Mr. H. C. McLaughlin, Galp, Ont.



Barn of Mr. W. E. Parker & Son, Watford, Ont.



Barn of Elliott Bros., Woodstock, Ont.

VENTILATING THE BARN

Admit the Fresh Pure Air

The modern well-built barn and stable requires ventilation. Fresh air and dryness are important essentials. Installation of a good ventilation system, to provide fresh air and to keep the stable dry, is recommended.

A cow can live six weeks without food, and six days without water, but she cannot exist for six minutes without air. Careful experiments have revealed that a mature animal averaging 1000 lbs. should have between 50 and 60 cubic feet of air a minute or, to be exact, 3,545 cubic feet of fresh air every hour. This quantity of fresh air movement into the stable cannot be maintained without marked heat loss, when temperatures outside drop below freezing. Therefore, maintaining and varying a constant inflow of fresh air as a means of regulating the stable temperature, rather than the maximum requirements of the animal, is preferred. If effective ventilation is to be maintained, the inflow of fresh air in cold weather should not drop below 1085 cubic feet per hour for each 1000 lb. animal in the stable.

The life-preserving, blood-purifying element in fresh air is oxygen. Each time air is inhaled by the cow, some of the oxygen is drawn into the blood. The cow has a large blood stream to purify and requires large quantities of oxygen.

Effective ventilation will bring to the cow an unfailing supply of fresh, invigorating air every hour of the day or night. It will remove, with equal efficiency, foul air and offensive, harmful odors from the stable. Through ventilation only will the animals receive the quantities of oxygen they need. Plenty of fresh air in the stable is as essential to animals' health and welfare as sunshine, water, and even food itself. The animals must be healthy and vigorous to profitably turn adequate quantities of carefully selected and balanced food, daily, into milk and meat products. To get full benefit from the feeds consumed, and do their best, they must have an abundance of fresh air.

Remove Moisture

Ventilation is also required to remove moisture from the stable. It is estimated that in twenty-four hours a cow will give off 1-2/5 gallons of water in the form of water vapour in her breath. Thirty cows will give off more than a barrel of water into the air in twenty-four hours. If moist air is not removed by a good ventilation system, the stable atmosphere is super-saturated with damp vapour, harmful to animals. They cannot stand within ten degrees as much cold in a damp stable as they can in a dry stable.

In poorly ventilated stables where air is foul and clammy, drained of oxygen, laden with moisture and often disease germs, cattle will not develop as rapidly nor do their best. The result will be delicate animals susceptible to tuberculosis, mastitis and bangs disease. Dampness is harmful in any stable. It creates offensive odors and breeds disease.

Good ventilation prevents the formation of ammonium carbonate. This compound results from the union of carbon dioxide, in the air of a poorly ventilated stable, with the ammonium fumes given off by manure. It falls as a whitish coating on woodwork, beams and harness where it rots both wood and leather.

STABLE

V E N T I L A T I O N



Barn at Woodwynn, Farm of Hon. W. C. Woodward, Victoria, B.C.



Barn of Dr. Newman, Merrickville, Ont.



Barn of Hon. A. C. Taylor, Salisbury, N.B.



Barn of Col. C. D. H. MacAlpine, Ridge House Farms, Fenelon Falls, Ontario



Barn of Mr. H. J. Clark, Ottawa, Ont.



Barn of Mr. F. W. Argue, Carp, Ont.

Control Temperature

A good ventilation system will air condition the stable. It will regulate temperatures and prevent heat loss. It will control humidity and prevent corrosion. It will promote health and comfort. It will greatly help to raise the animals' vitality to the highest point, so necessary in achieving higher production records and maximum results from the feed. It will eliminate stable odors, and will aid in the production of clean, wholesome, untainted milk.

Fresh air should be allowed to come into the stable regularly as required, and through properly placed fresh air inlets built into the walls of the stable. These fresh air inlets should have dampers for controlling the volume of fresh air admitted to the stable, depending on wind pressure outside and temperature inside. Foul air should be carried off through foul air outlet shafts of adequate size or by electric fans suitably placed to expel the foul air from the building.

Avoid closely-built stall partitions, which hinder circulation of air and reduce efficiency of a ventilation system. The open construction of Beatty Steel Stalls will allow fresh air to circulate properly. A good ventilation system, properly operated, will make the stable warmer in winter, cooler in summer and drier all the year around. It will soon pay for itself.

Conditions for Efficient Operation

For the efficient working of any ventilation system, the stable should contain approximately 600 to 650 cubic feet of air space for each full-grown animal in the stable. This will vary according to locality and severity of climate. Horses take a little more, younger and smaller stock a little less. If this amount of air space is reduced, it is difficult to ventilate properly, and if increased, it is difficult to keep the stable warm.

Fresh air inlets and foul air outlets must have the correct area or capacity in proportion to each other. The number and capacity must be correct according to the size of the barn and the number of animals in the stable. They must be carefully placed throughout the stable in correct relation to one another so that the fresh air will circulate properly through the building. The best results from any one of the three methods of ventilation outlined in this book will be obtained by following the tables specifying the number and size of fresh air inlets and foul air outlets to be used. There is a slight difference depending on the type of ventilation to be installed.

The temperature most suitable for airy stables is 50 to 55 degrees and for hog stables 55 to 60 degrees fahrenheit. Beef stables can go as low as 45 degrees. In this connection, read the information on walls, given on pages 108 and 109, because the construction of the walls has much to do with the temperature of the stable and its dryness. Ceilings, ceiled under the joists, allow better air circulation.

Systems of Ventilation

Two systems of ventilation are commonly used in North America. One is the natural or gravity system and the other a system of forced air circulation by the use of motor-driven exhaust fans for expelling foul air from the stable.

GRAVITY VENTILATION

Showing position of Roof Ventilators, Foul Air Shafts and Fresh Air Intakes.

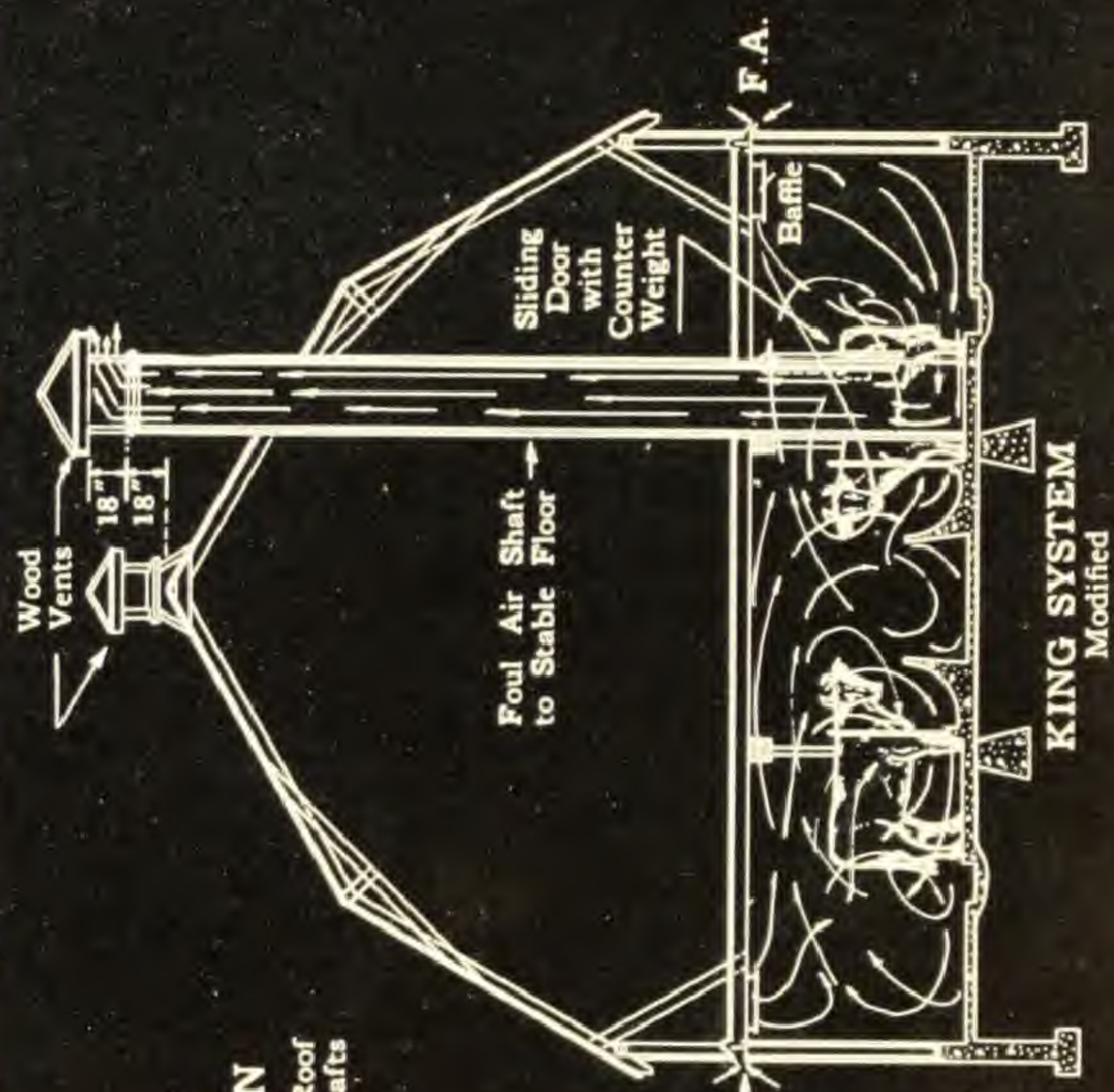
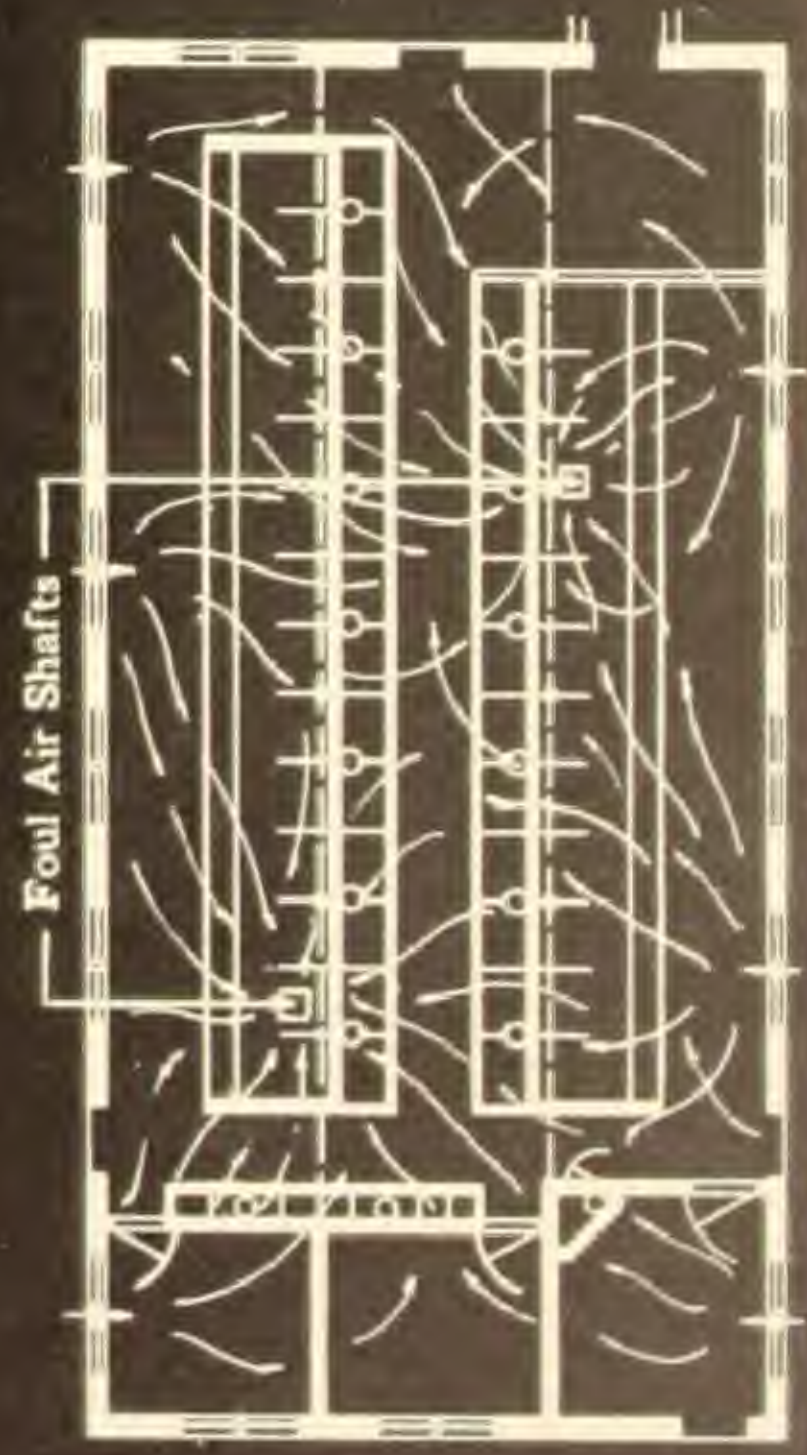
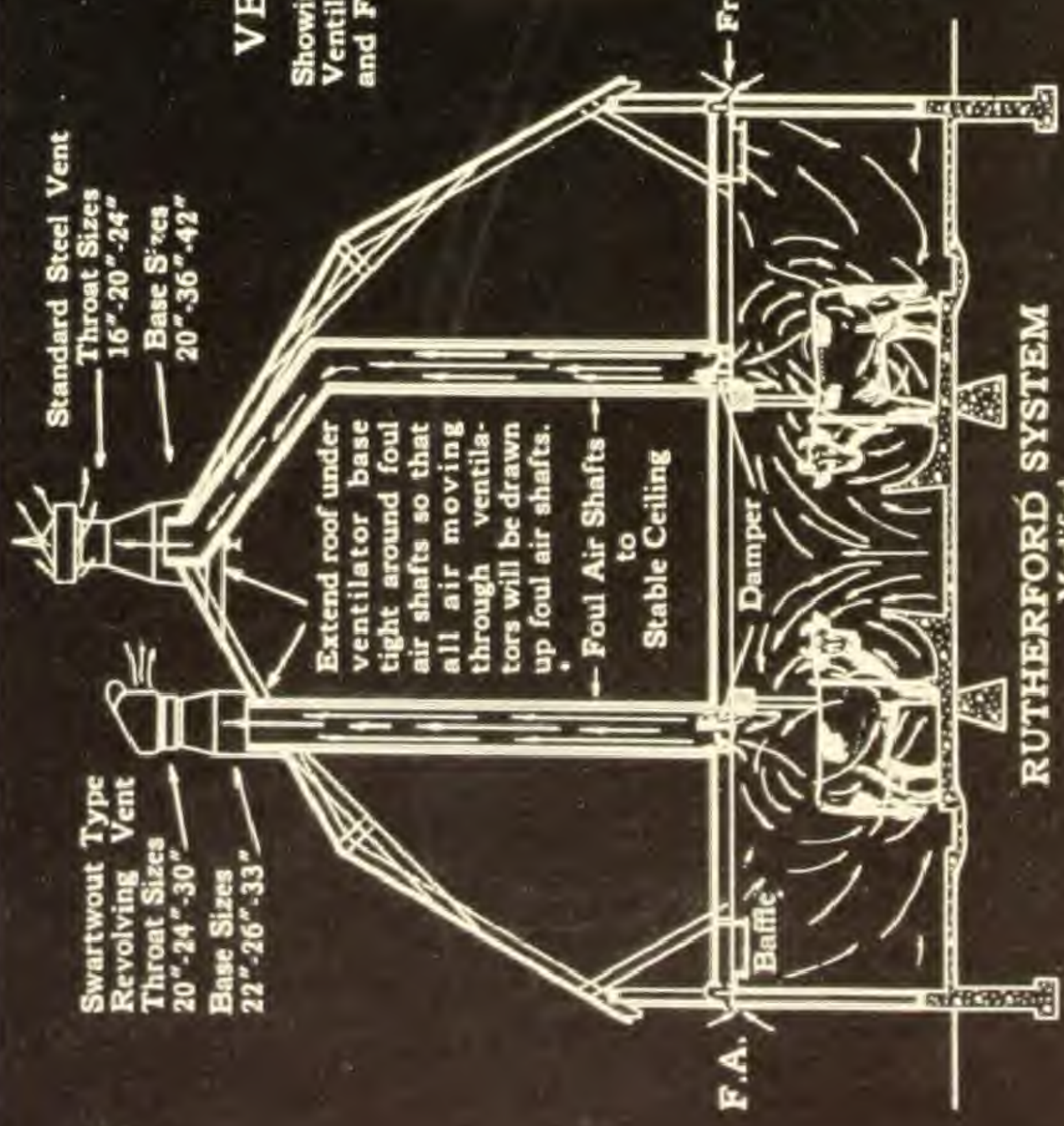


Diagram of Fresh Air Intakes and Foul Air Outlet Shafts of both systems

Gravity systems are divided into two general classes based on the point from which air is admitted to and removed from the stable. Some advocate the opening into the foul air shaft at the ceiling of the stable while others carry the shaft down and remove the foul air through an opening in the shaft just above the stable floor.

RUTHERFORD SYSTEM

Removal of Foul Air From Ceiling

The principle of taking foul air off at the ceiling and admitting fresh air at the floor is called the Rutherford system. Its advocates claim it works on the same principle as a stove. A damper is opened at the bottom of the stove allowing cool air to pass into the stove where it is heated, becomes lighter than cool air, rises and passes out the chimney.

Using the same principle for ventilation, fresh air is admitted near the floor, or at the ceiling and allowed to fall to the floor. Animals exhale warm air and this, with their body heat, raises the temperature in the stable. The warm, stale air, carrying the moisture, rises to the ceiling and is carried off through outlets in the ceiling which lead to the peak of the roof. Fresh air from inlets in the stable walls replaces the warm, stale air which has been carried off.

The area of fresh air inlet and area of foul air outlet required for different kinds of stock for the Rutherford system is given below. One 18 in. x 18 in. outlet will do for twenty cows.

Stock	Inlet Area per head	Outlet Area per head	Number supplied by 1 Beatty Fresh Air Inlet
Horse.....	9½ sq. inches	18 sq. inches	3
Cow.....	8 "	15 "	4
Hog.....	4 "	8 "	8
Sheep.....	2½ "	5 "	12
Hens.....	2 "	2 "	
Chicks.....	¼ "	¼ "	

KING SYSTEM

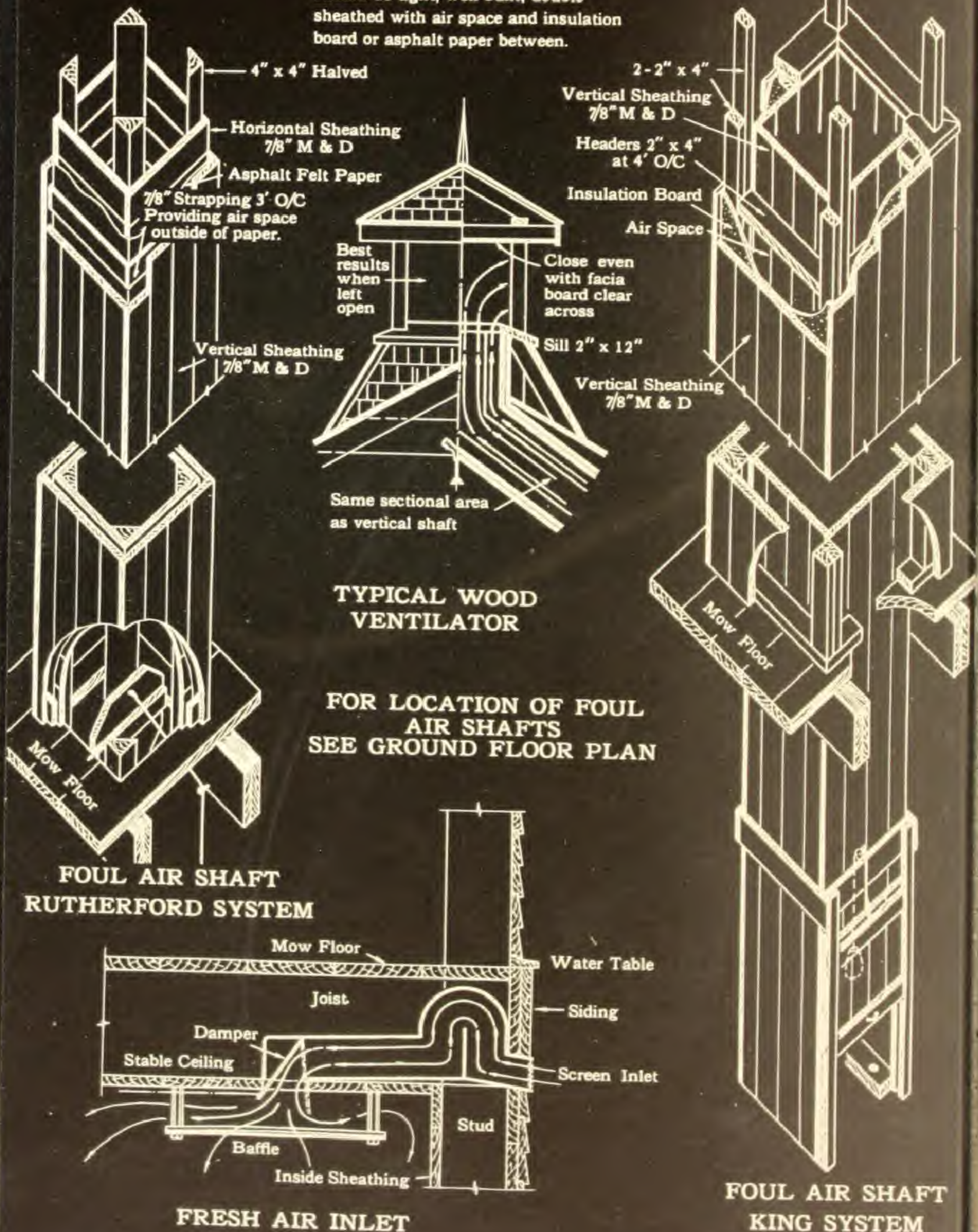
Removal of Foul Air from Floor

Introducing fresh air at or near the ceiling and removing foul air from a point near the floor is called the King system. The theory is that stale air, charged with carbon dioxide, is heavier than air and will settle to the floor and be the first to be removed. A difficulty with this method is to move moist, damp air from the ceiling where, under certain conditions, it collects, causing wet and drip. An advantage of this method is that it conserves warmth created by animals and higher stable temperature results.

When the foul air shaft is constructed down to the floor of the stable, the opening into the shaft for escape of foul air is provided by a sliding door fitted with a counter weight. This door can be easily adjusted up or down to regulate the size of the opening into the shaft, dependent on the temperature inside the stable. In stables of the City of Montreal the foul air shaft is built down to the floor with satisfactory results.

FOUL AIR SHAFTS

Showing detail of construction. Shafts should be tight, well built, double sheathed with air space and insulation board or asphalt paper between.



TYPICAL WOOD VENTILATOR

FOR LOCATION OF FOUL AIR SHAFTS SEE GROUND FLOOR PLAN

FOUL AIR SHAFT RUTHERFORD SYSTEM

FOUL AIR SHAFT KING SYSTEM

FRESH AIR INLET

The area of fresh air inlet and the area of foul air outlet required for different kinds of stock for the King system is given below:

Stock	Inlet Area per head	Outlet Area per head	Number Supplied by 1 Beatty Fresh Air Inlet
Horse	12 sq. inches	28 sq. inches	2½
Cow	10 "	24 "	3
Hog	5 "	13 "	6
Sheep	3 "	8 "	10
Hens	2½ "	3¼ "	12
Chicks	¼ "	½ "	

Foul Air Shafts Important

With either of the gravity types of ventilation, attention should be given to the construction and size of the foul air outlet shafts. For both systems they must be built air tight on all sides, using two layers of tongued and grooved lumber, air space and one ply of good building paper, roofing or other insulation between. The shafts should extend from the stable through the mow and through the roof into the cupola and above the peak. Air leaks into the foul air shafts will greatly impair their ability to lift foul, moist air from the stable. Extend the barn roof under the ventilator base and tight around the foul air shafts so that all air movement through the ventilators will be drawn up the foul air shafts. The inside size of the foul air shaft, as marked on the ground floor plan of the stable, should be carried without reduction right through from the stable to the cupola on the roof. If the depth must be diminished because of hay track, increase the width to permit the same inside dimensions throughout. Both the fresh air inlet and the foul air outlet shafts should be equipped with regulating dampers conveniently arranged to control the intake and outlet of air.

Where gravity ventilation is used, most Ontario and Western farmers favor taking the foul air off at the ceiling of the stable. The danger of heat loss is offset by a drier ceiling. Many object to the appearance of the foul air shaft continuing down to the stable floor, loss of stall space and extra cost of building to the stable floor.

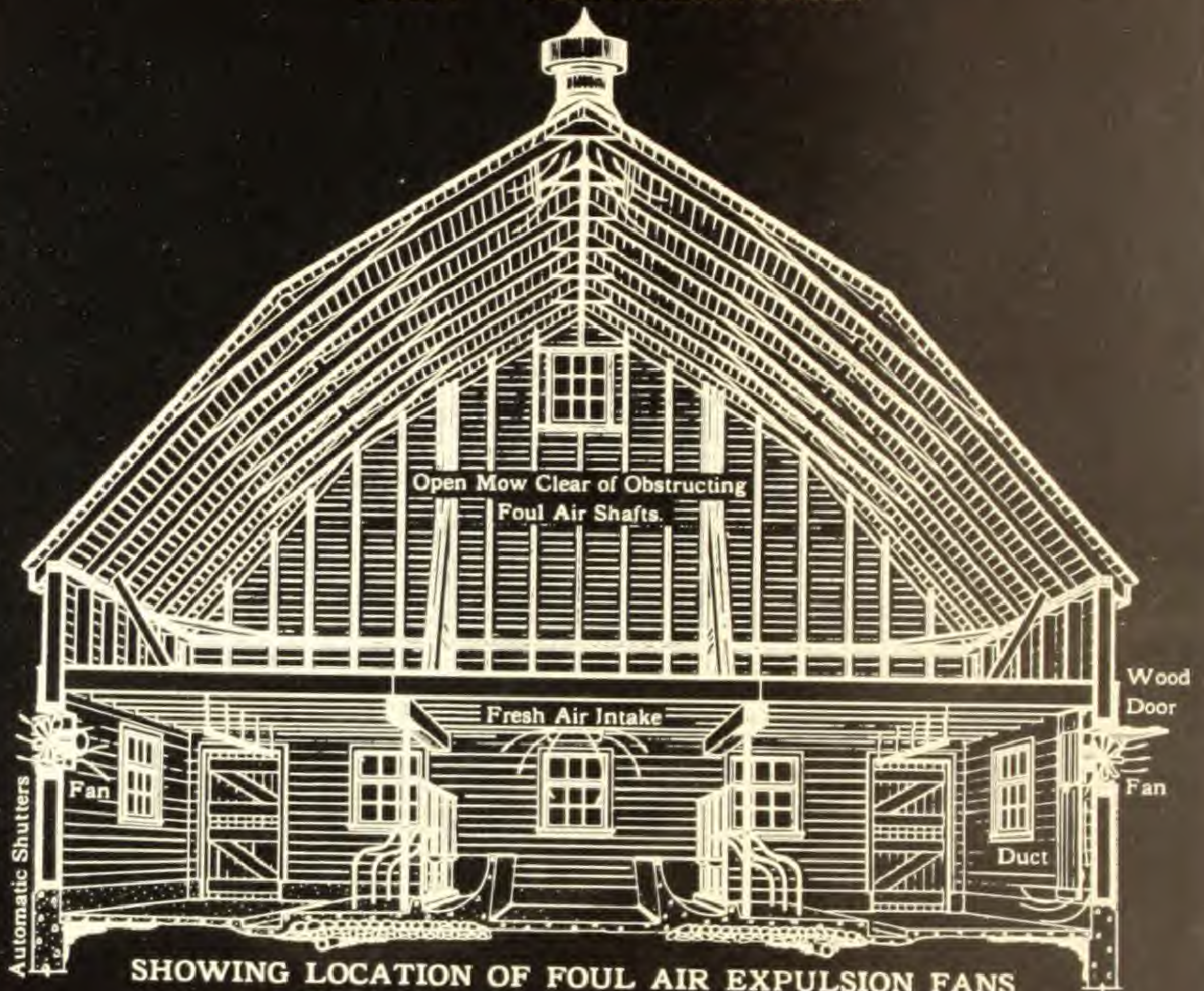
Both systems will operate and give satisfactory results providing they are properly installed. Both methods of construction are illustrated on pages 102 and 104 and best results will be obtained by following the tables showing the area of fresh air inlet and foul air outlet required for the number of animals in the stable.

Electric Fans for Ventilation

Where electric power is available, fans driven directly by electric motors may be used for exhausting the foul air from stables. The fan draws the foul, moisture-laden air out of the stable. This creates air circulation inside and a constant flow of fresh, pure air into the stable through fresh air inlets.

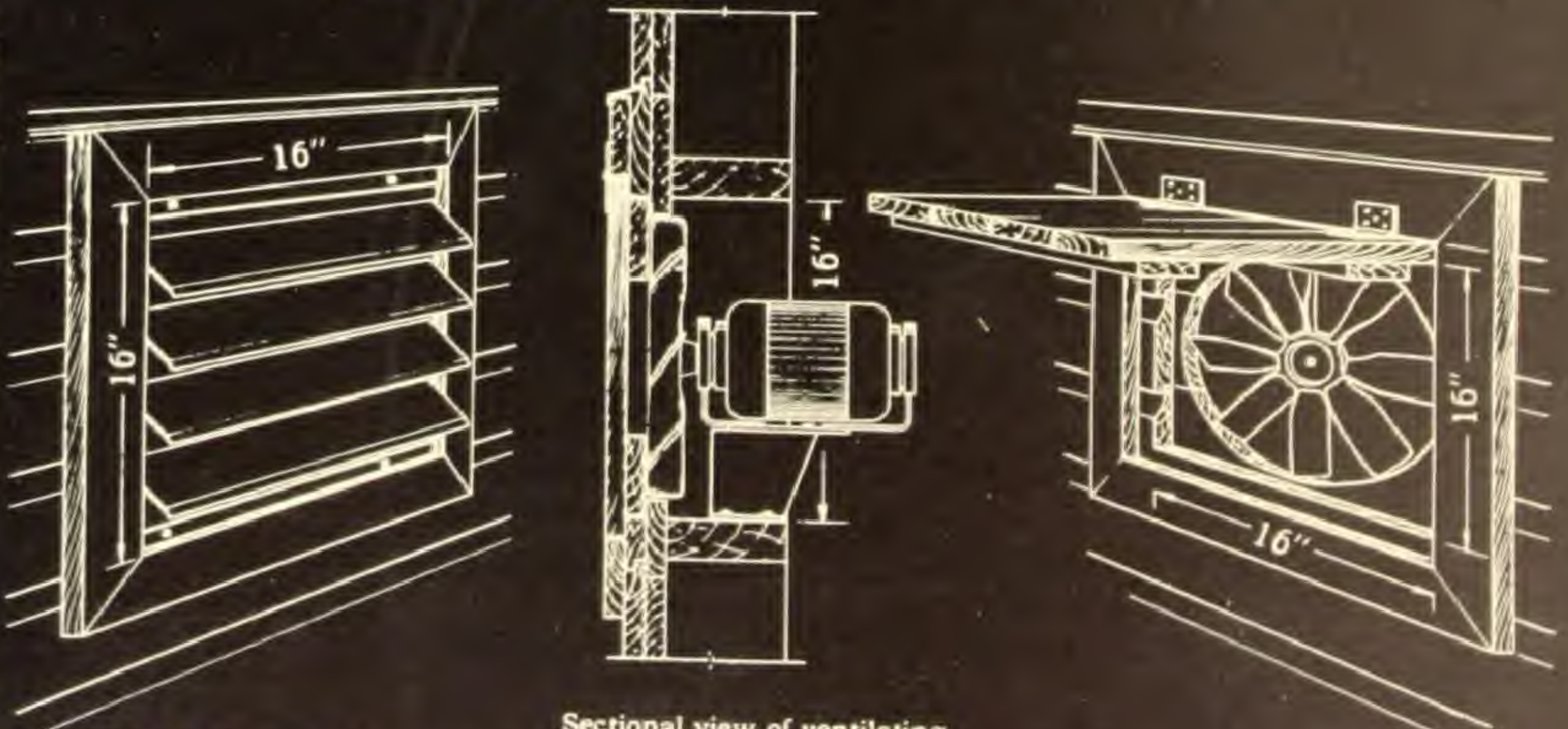
One or more electric, motor-driven ventilating fan units, depending on the size of the stable and the number of animals housed, can be easily fitted into prepared openings in the side wall of the stable. These openings can be closed when the fans are not in use by installing manually operated doors or by automatic self-closing shutters, purchased with the fans. When the fan starts, the shutters automatically open by the force of the air leaving the fan. For convenience, the

FAN VENTILATION



SHOWING LOCATION OF FOUL AIR EXPULSION FANS

Foul air may be expelled from the ceiling or drawn from the floor of the stable by means of a duct built over the fan and down to within one foot of the floor.



Automatic shutters close opening when fan is not in operation.

Sectional view of ventilating fan motor and stand.

Fan installation showing wood door closed by hand when fan is not in operation.

METHODS OF INSTALLING FAN VENTILATION IN STABLE WALLS

fans are usually placed as close to the stable ceiling as possible. If foul air is to be lifted and expelled from the floor, ducts may be built over the fan and down to the floor. If preferred, fans may be placed just above the stable floor and foul air expelled directly through the fan to the outside of the stable.

Beatty electric fans maintain a constant flow of foul air in all kinds of weather. With the exception of a very slight variation at different air temperatures and pressure, the fan will expel as much foul air from the stable on calm, sluggish days as in clear weather. On the other hand, the successful operation of natural or gravity ventilation depends entirely on the ever-changing atmosphere with the result that its efficiency drops rapidly on calm, humid days. It is on calm, humid days that air circulation and good ventilation inside the stable are most desirable. This accounts for the ever-increasing interest in fan ventilation. The fan will also remove a certain amount of dust from the stable.

Fans Eliminate Costly Foul Air Shafts

The side-wall, motor-driven ventilating fan saves all the work, worry and expense of building foul air outlet shafts right up through the barn mows to the peak and fitting them into the roof cupolas. This saving will go a long way toward paying for motors and fans.

Problems to be overcome when constructing foul air shafts, for gravity ventilation are many. It is difficult without inconvenience, to place them in positions where they will be most effective, because of interference with drive floors, granaries, feed chutes, and the barn frame. They are difficult to brace and they take up valuable space in the mow. One of the biggest problems is to build the foul air shafts so that they will be effective and at the same time will not interfere with the satisfactory operation of a hay carrier.

It is difficult to prevent condensation and drip from foul air shafts in winter. Moisture causes the wood in the shafts to swell out of shape. The wood dries out in summer causing air leaks into the shafts, impairing their effectiveness the following season. It is also difficult to keep weather and rot away from foul air shafts where they extend through the barn roof. All these worries are overcome when motor driven fans are used in place of foul air shafts.

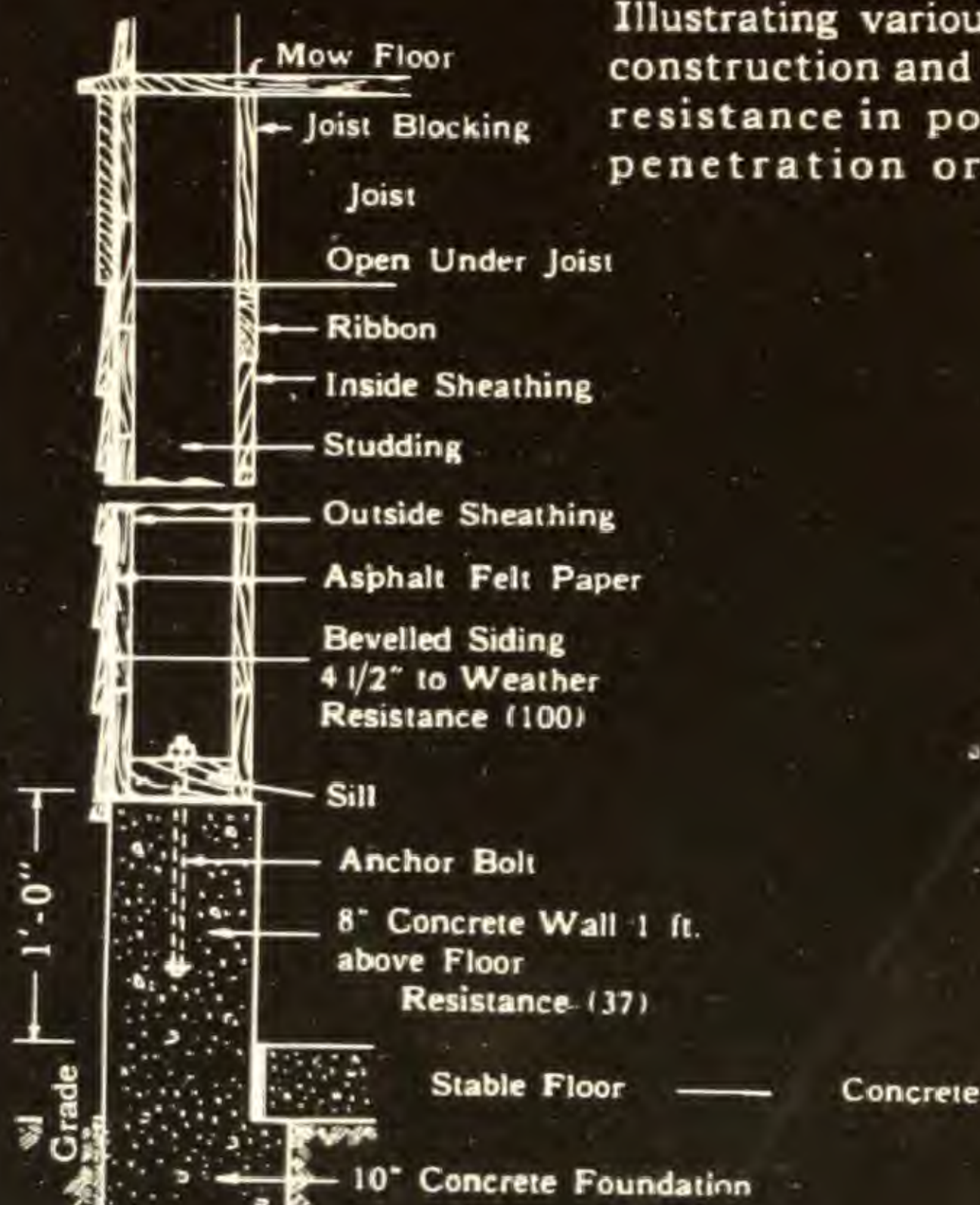
The Beatty motor-driven fan unit consists of the fan, a fully enclosed electric motor, propeller fan type, with two-speed switch and a heavy motor support bracket for attaching the unit to the stable wall. The unit can be purchased with or without the guard for the inside of the fan and with or without the automatic, self-closing shutters for the outside of the fan.

The Beatty motor-driven fan is easy to install. It is shipped complete in one unit ready to bolt into place. The unit uses very little electricity and is easy to operate. Just push the button to start or stop the fan. Better year-around ventilation will be ensured by installing Beatty motor-driven fans.

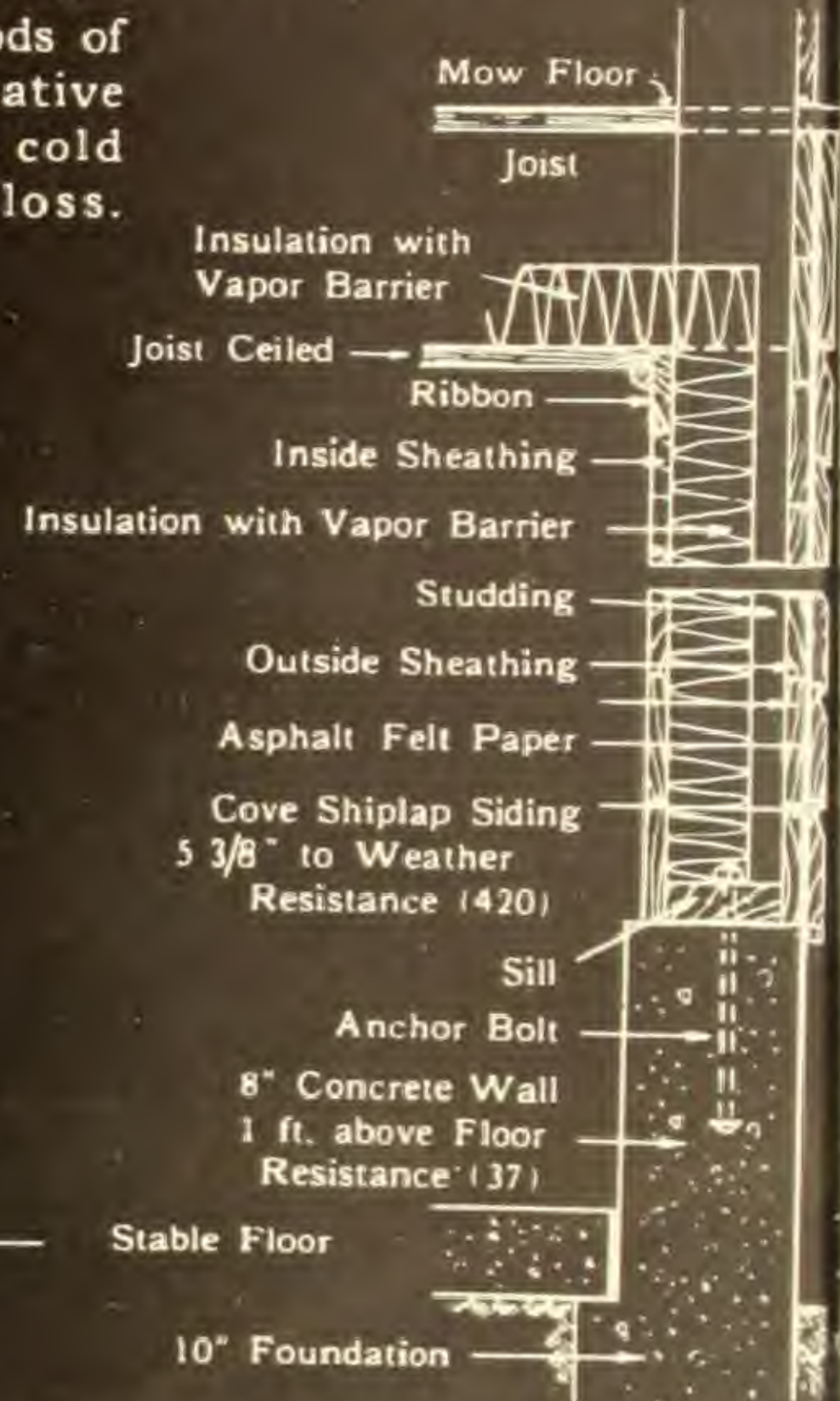
The method of installing Beatty electric motor-driven ventilating fans is one of the most important details in modern barn and stable construction. See installation drawings on opposite page and for more complete details and information write Beatty Bros. Limited. When ordering, be sure to give details of electric current.

STABLE WALLS

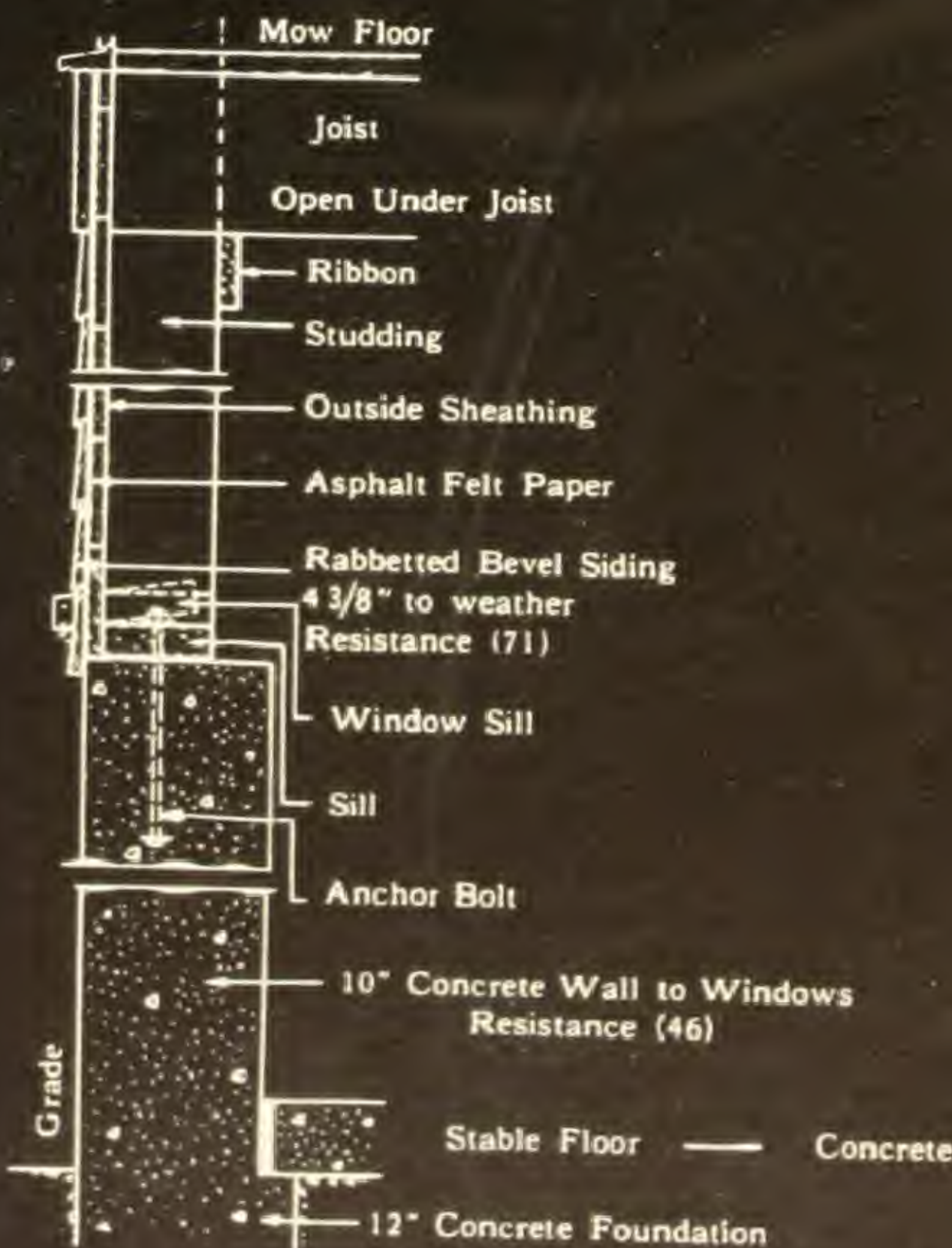
Illustrating various methods of construction and comparative resistance in points to cold penetration or heat loss.



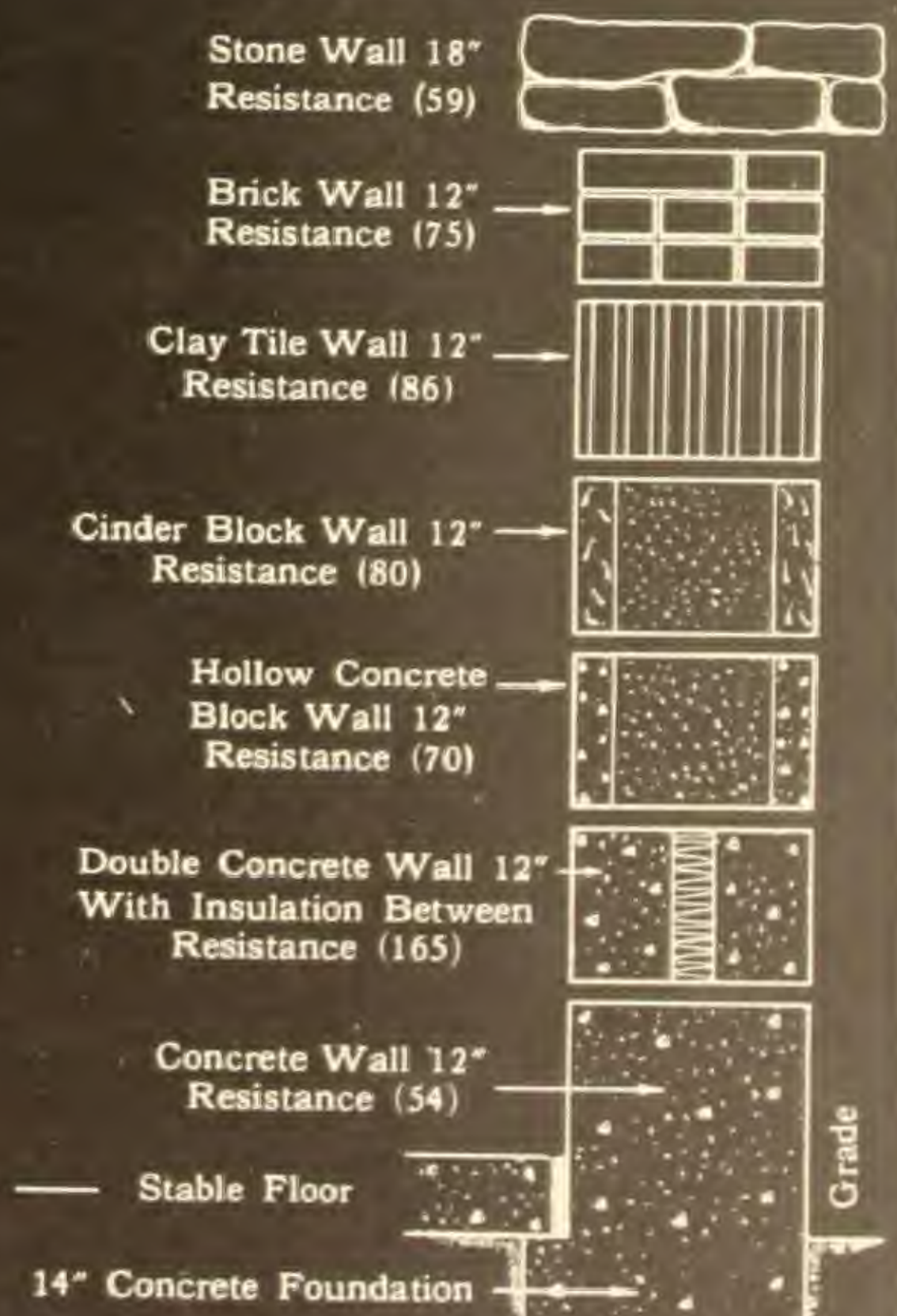
NON-INSULATED FRAME WALL ON CONCRETE BASE



INSULATED FRAME WALL ON CONCRETE BASE



MASONRY WALL TO WINDOW FRAME WITH OPEN STUDDING TO JOIST



MASONRY WALLS VARIOUS TYPES

Barn Foundations

Barn foundations should be built of concrete with a heavy footing, the base of which can be compared with the cross of an inverted T. Footings should be twice the width of the foundation wall and not less than one foot deep, with the bottom below the frost line. Walls are 10 to 12 inches thick down to the underside of the stable floor, depending on the weight of the barn above, then increased two inches to form a shoulder to carry the stable floor. Note the cross sections illustrating barn framing and foundation walls on pages 47 to 67. Heavy concrete footings should be laid under supporting columns. They should be at least two feet square at the base by 18 inches deep. For heavy barns on soft ground, larger footings up to three feet square are necessary.

Stable Walls

While concrete is almost universally used for foundations below the ground, local conditions and available materials make a difference in what can be economically used above the ground. Concrete is comparatively easy to build and, where sand and gravel are easily available, is the type of wall most used. Where sand and gravel are not available, or where a drier stable wall is desired, brick, tile, cinder block, or wood built of studding, double sheathing and building paper between, are frequently used. The concrete foundation is built up to a point well above the grade, usually one foot or more above the stable floor, and the other types of walls built on top of the foundation. Concrete to window sills and above, makes a very satisfactory stable wall.

Thickness of Stable Walls

Stable walls vary in thickness, depending on materials used. Walls of concrete, brick, cinder block or tile, for heavy barns, are usually 10 to 12 inches thick; stone 18 to 22 inches thick. For wood walls, the studs should be 2 in. x 10 in. or not less than 2 in. x 8 in. placed close enough to ensure adequate strength, usually two feet but not over 2 ft. 6 in. centre to centre, according to the weight of the barn. These sizes can be reduced for lighter loft-type and one-storey barns.

Forms of matched sheathing, with the dressed side in, should be used for pouring concrete walls. Sheathing is supported by 2 in. x 4 in. studs set 18 inches apart. The forms are then erected, properly spaced, securely tied and braced ready for pouring the concrete. Anchor bolts $\frac{5}{8}$ in. thick by 15 inches long should be embedded around the top of the wall at intervals of seven feet or less and should project upward one inch higher than the thickness of the plate used for the base of the barn frame. This secures the barn frame solidly to the foundation.

Wood Walls for Stable

A wide variety of wood is suitable for the outside of stable walls, such as V-match, shiplap, clapboard and other overlapping lumber, applied horizontally. Tongued and grooved or sized and battened stock is applied vertically to avoid danger of water getting into the grooves and rotting the lumber. Galvanized, sheet-iron siding, over lumber and building paper, can also be used.

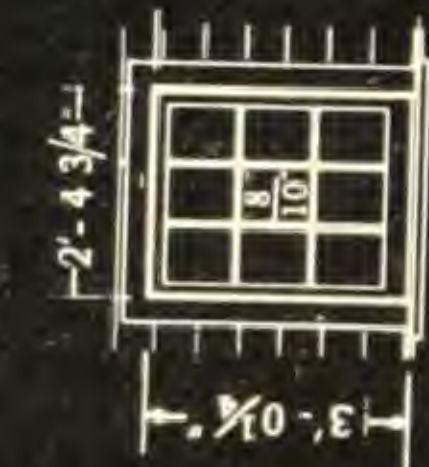
BARN

FOUNDATIONS AND WALLS

BARN AND STABLE WINDOWS



Popular windows for cattle and horse stables.
Single Sash—Single spacing. Glass area per window 8 sq. ft. Size of Sash given above.



Popular windows for hog houses.
Single Sash—Single Spacing North Side. Glass area per window 5 sq. ft. Size of Sash given above.



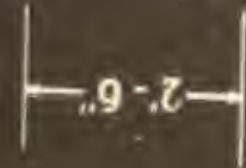
Windows as above in group of two.
Glass size 10" x 12"



South side windows as above in groups of two.
Glass size 8" x 10"



Windows as above in group of three.
Support header and joist between each window.



Shallow windows used at cattle pens.
Glass area per window 5 sq. ft.
Glass size 10" x 12". Size of Sash given above.
Support heavy barns between each window.

BARN AND STABLE

W I N D O W S

A wood frame stable wall is usually constructed by sheathing the outside of the studs with rough lumber, adding building paper and finishing lumber outside. Additional warmth can be provided by sheathing the inside of studs. Double sheathing, with building paper between, on the inside as well as the outside of the studs; double sheathing with paper between on the outside of the studs; a vapor-proof barrier; insulation; air space and sheathing on the inside of the studs; will ensure an exceedingly warm stable wall.

The following heights from the finished floor to the bottom of the joist for stable ceilings are recommended: Horse—9 ft. 6 in.; combined cattle and horse—8 ft. 6 in.; cattle 8 ft. 6 in.; hog houses 7 ft. 6 in.

Barn and Stable Windows

Stable windows are important. Through them sunshine, one of the greatest essentials of a satisfactory barn, is admitted. Sunshine warms and dries the air. Sunshine helps to control disease and parasites. Sunshine makes the stable cheerful and comfortable. To carry on the heavy task of producing milk and, at the same time, to keep in condition to produce healthy calves, the cow must get as much sunshine as possible through the long winter months. Note how sunlight floods every corner of the stables shown in this book because plenty of windows of suitable size have been used and the sunlight has not been obstructed by solid wood or concrete stall and pen partitions. Open steel partitions allow free passage of light and warmth.

Two methods are followed in deciding the size and number of windows for the stable, viz., four square feet of glass for each mature animal in stalls or window space equal to 10 per cent. of the stable floor area for cattle and horse stables. Hog houses require 2 to 2½ square feet of glass for each mature hog. Hog houses running East and West should have smaller windows in the North and larger windows in the South. Consider balance and appearance and be liberal in providing window accommodation. It is a good investment.

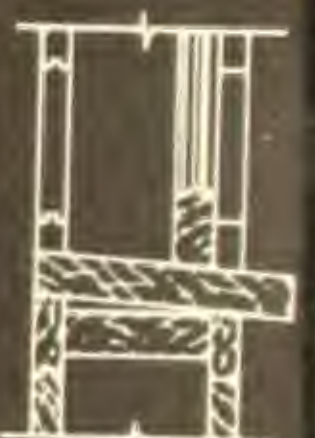
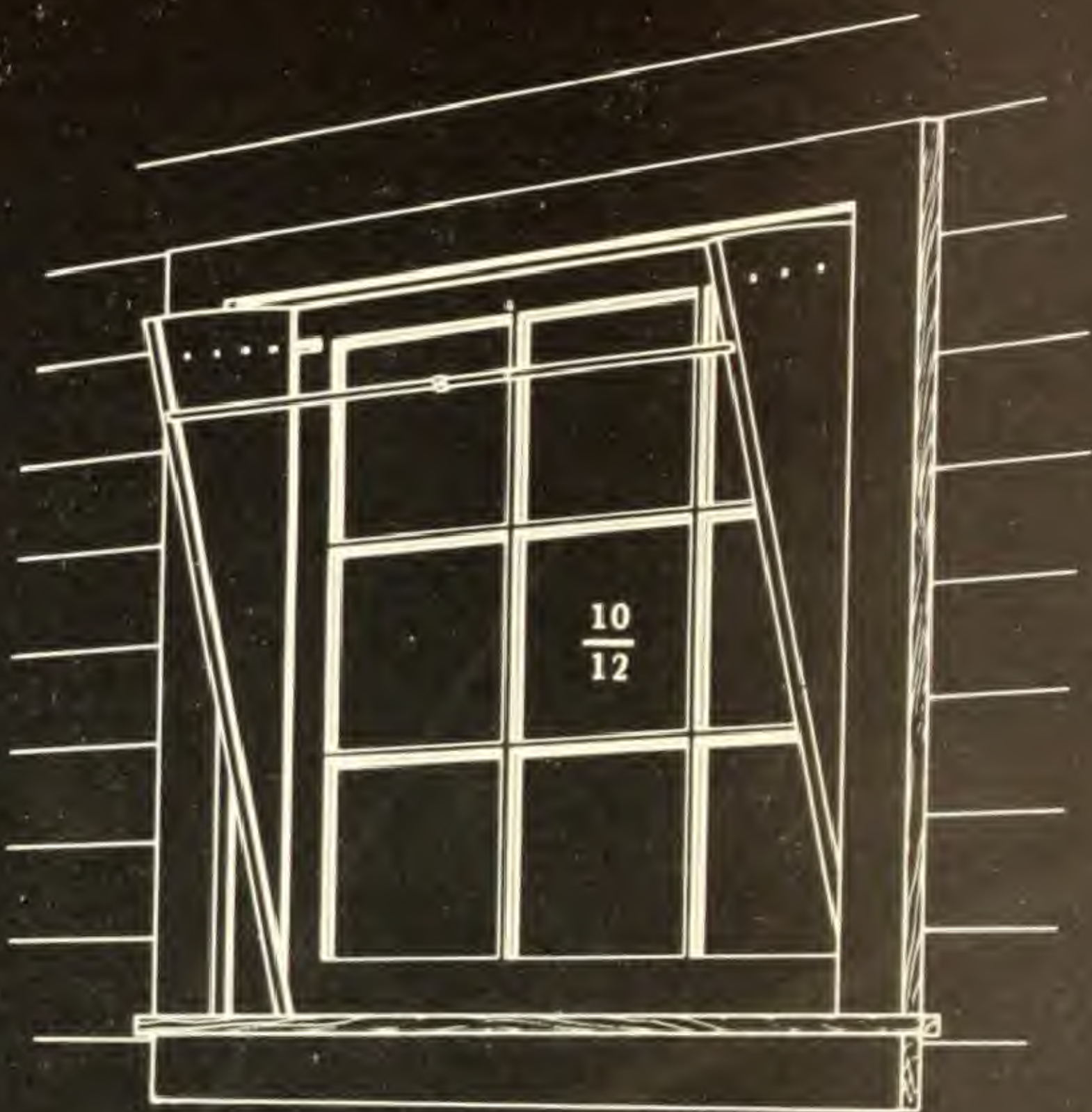
Standard Sizes

The nine-light window, single, in pairs or in a group of three, well spaced around the walls, is popular for cattle stables. These windows are made up in one sash, hinged to open from the bottom as illustrated on the opposite page. Or they can be made in two sash, allowing the top row of lights to be hinged.

The following windows are standard and most frequently used:

Cattle and horse barns	{	Two sash; bottom, 6 lights 10" x 12"; top, 3 lights 10" x 14" hinged.
	{	One sash; 9 lights 10" x 12"; single, in pairs or groups of three.
Pen barns	{	One sash; 6 lights 10" x 12"; single or in pairs.
Hog and sheep houses	{	One sash; 9 lights 8" x 10"; single or in pairs.

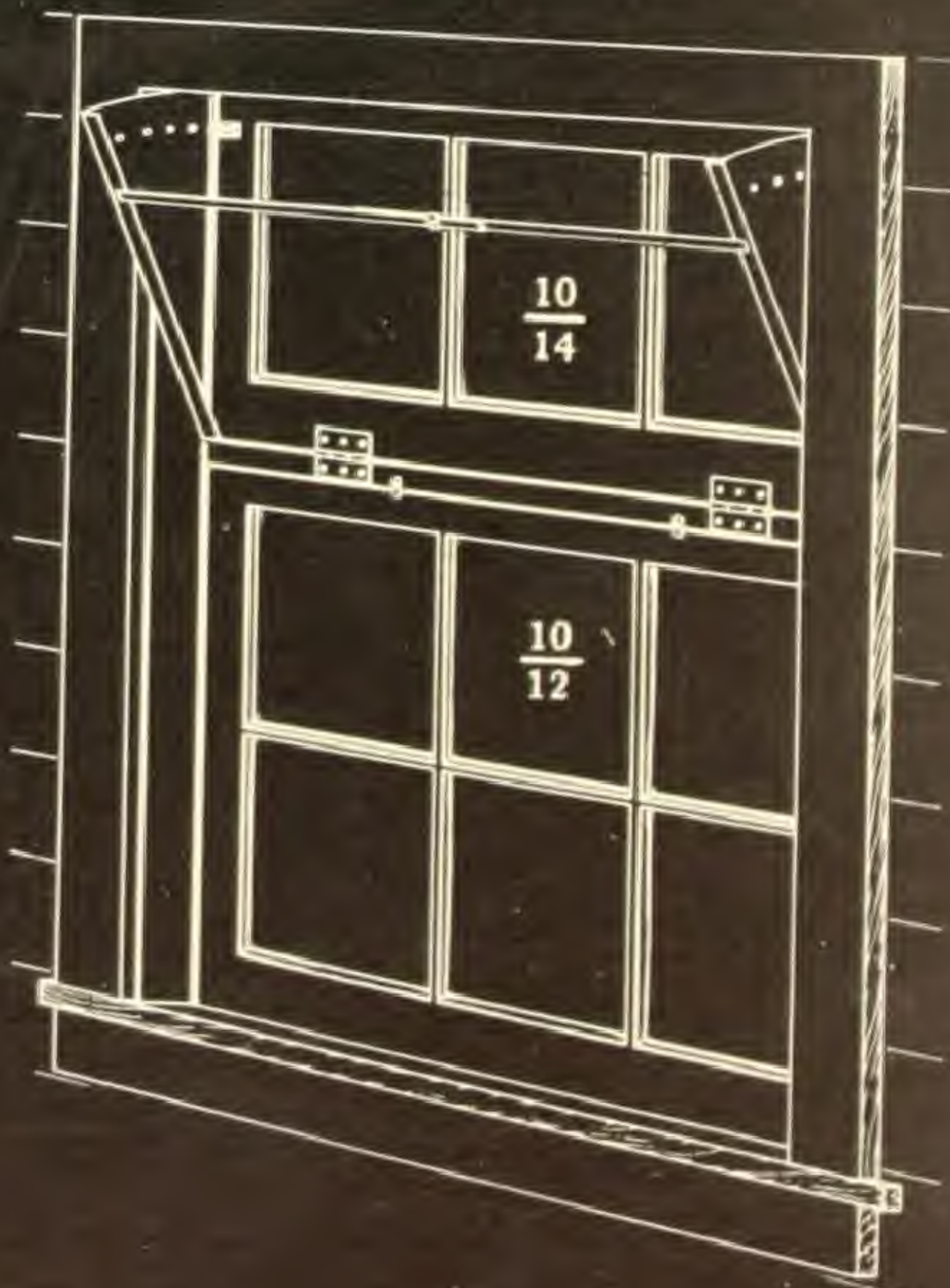
POPULAR STABLE WINDOWS ILLUSTRATING METHODS OF FRAMING AND USE OF WINDOW SHIELDS.



Sill in Frame Wall



Sill Masonry Wall



Rabbeted Window Frames

The distance between windows will vary according to the type and number used. They should be evenly spaced to present a fine side appearance from outside and placed not less than three feet above the stable floor. Where possible windows should be placed with their length up and down and not horizontally, so they will distribute more light. Stone walls around windows should be splayed to allow the sunshine to spread and flood the stable. Having provided for the entrance of plenty of sunlight its work should not be hindered by the use of solid wood or concrete stall and pen partitions. Sunlight should be allowed to penetrate to every corner of the stable through the open work of steel stalls and steel pen partitions.

In colder sections of the country, storm windows will prevent frost and excess moisture forming on the inside of window panes. The use of double-glassed sash is not recommended unless supplied by specialists who guarantee to seal the sash against the possibility of dirt and moisture getting between the panes of glass. Windows, in groups of two or three should have a heavy lintel over the frame to carry the ends of the joist. Single frames should be fitted with a strong support between to carry the ends of the joist.

Galvanized Window Shields—Fig. 268

Beatty window shields can be used to hold the window sash when open and to direct the air upward against the ceiling, preventing drafts on the stock. See illustration on page 112. A set of window shields consists of two shields, made of 20-gauge galvanized steel, 11 in. wide at the top, 1½ in. wide at the bottom and 3 ft. 5 in. deep, braced and strengthened across the front by a steel bar. The shields fit 9-light windows made with 10 in. x 12 in. glass and can be cut on the job to fit windows of smaller dimensions. The brace bar is adjustable for windows slightly wider or narrower than the windows mentioned above.

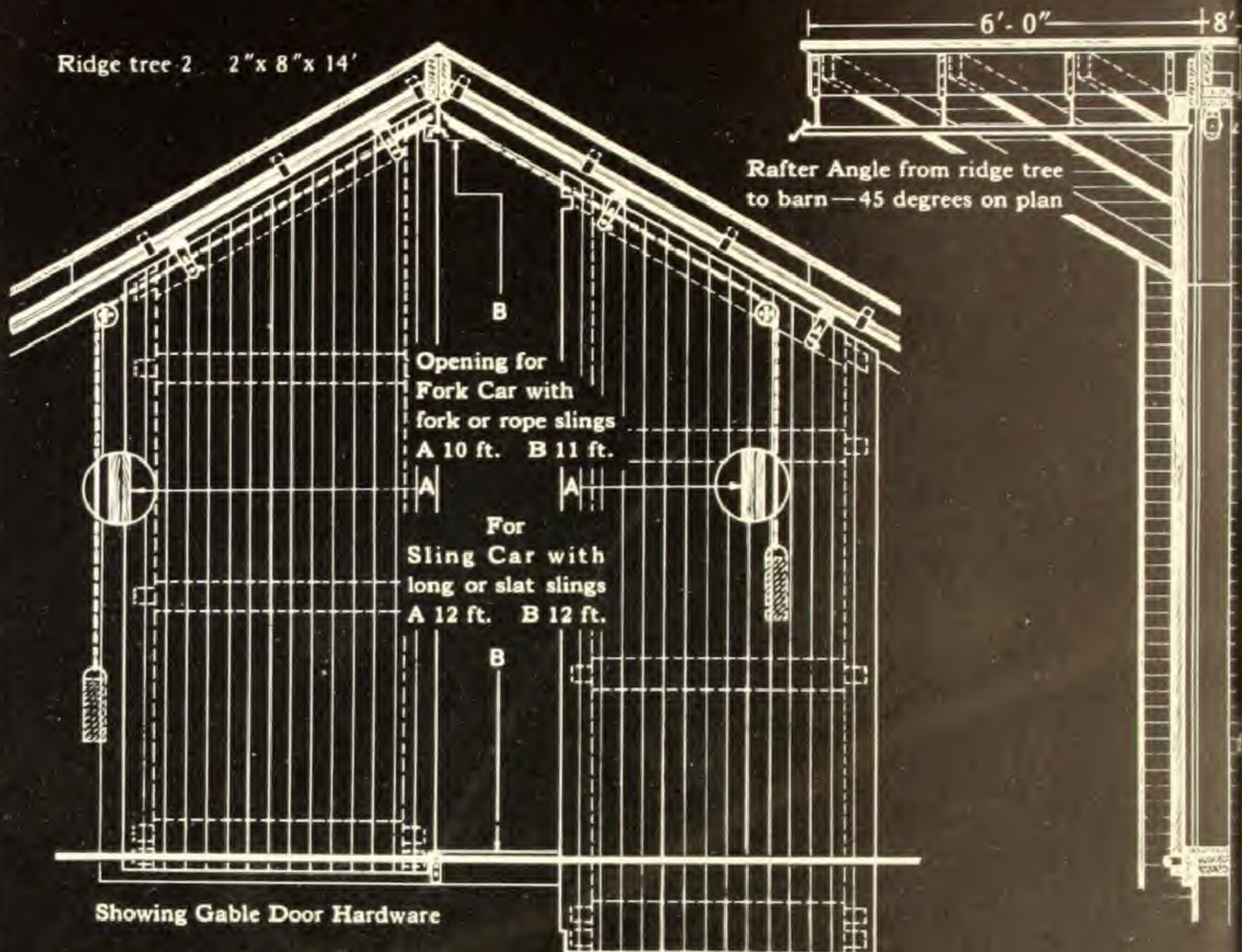
Barn and Stable Doors

Doors receive excessive use compared with other parts of a building. Barn and stable doors should be considered from the view point of convenience and necessity. The number and size required will depend largely on the layout of the building and the method of farming. To conserve warmth, stable doors should be located only where necessary and all doors should be correct size.

Doors have been carefully located and marked on the blueprint plans shown in this book. The following table will be useful in deciding how wide and how high barn and stable doors should be:

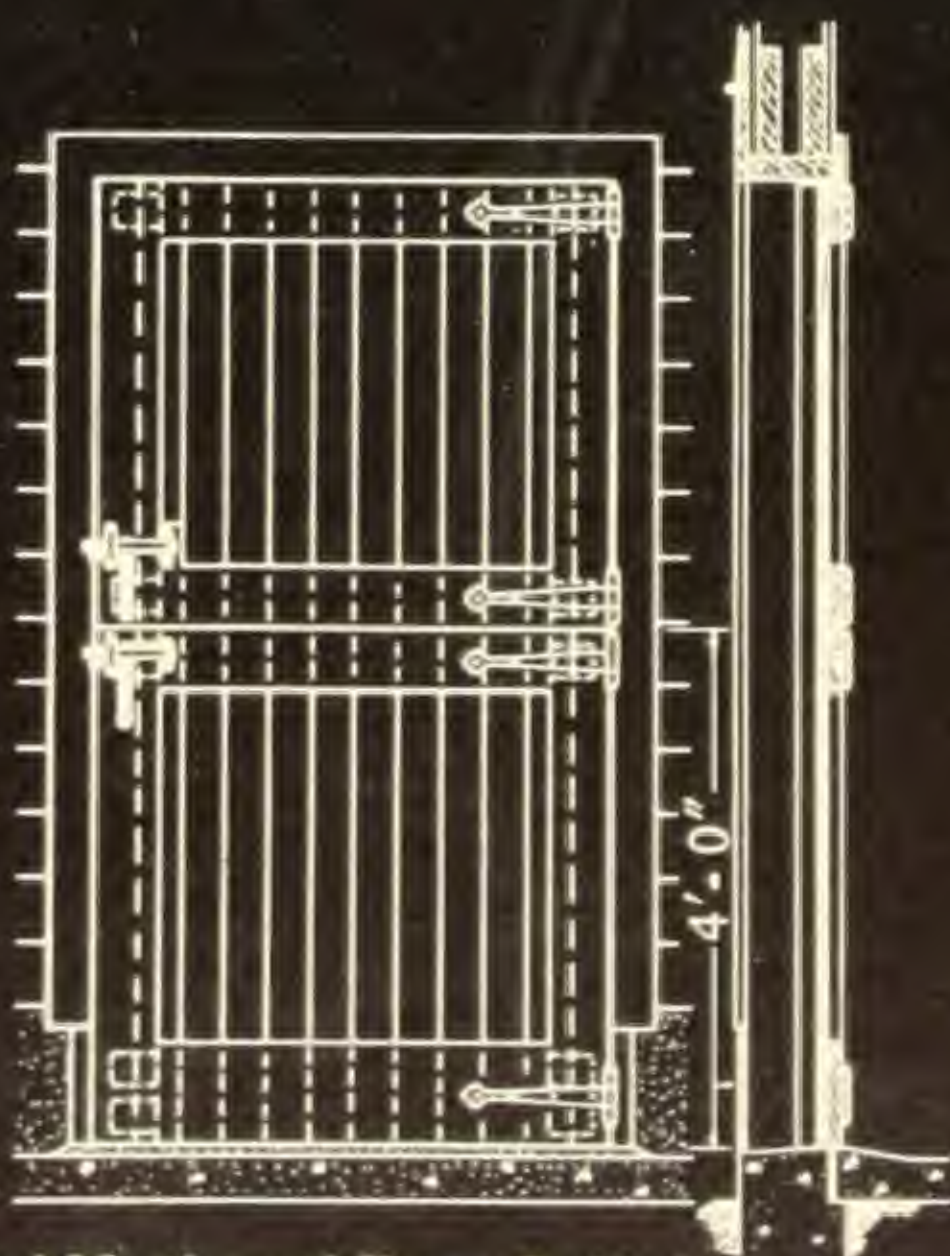
Entrance Doors.....	3 ft.	wide	x 7 ft. 8 in.	high
	3 ft. 6 in.	"	x 7 ft. 8 in.	"
Cattle Doors.....	3 ft. 6 in.	"	x 7 ft. 8 in.	"
Double Cattle Doors.....	8 ft.	"	x 7 ft. 8 in.	"
Horse Stable Doors.....	5 ft.	"	x 7 ft. 8 in.	"
Doors for Manure Carrier Track.....	Top in two sections. Same height as under side of girder.			
Doors to Hog Runs.....	2 ft. 3 in.	"	x 2 ft. 10 in.	"
Entrance Doors for Barn Drives.....	12 ft.	"	x 13 ft.	"
	14 ft.	"	x 14 ft.	"
Ventilating Doors opposite barn drive doors.....	6 ft.	"	x 8 ft.	"
Doors for Straw Blowers.....	2 ft. 6 in.	"	x 4 ft.	"
	3 ft.	"	x 5 ft.	"
Granary and Feed Room Doors.....	4 ft.	"	x 7 ft.	"
	5 ft.	"	x 7 ft.	"
Gable Doors.....	9 ft.	"	x 12 ft.	"
	10 ft.	"	x 12 ft.	"
	12 ft.	"	x 14 ft.	"

ROOF EXTENSION AND GABLE DOORS FOR UNLOADING HAY AT END OF BARN

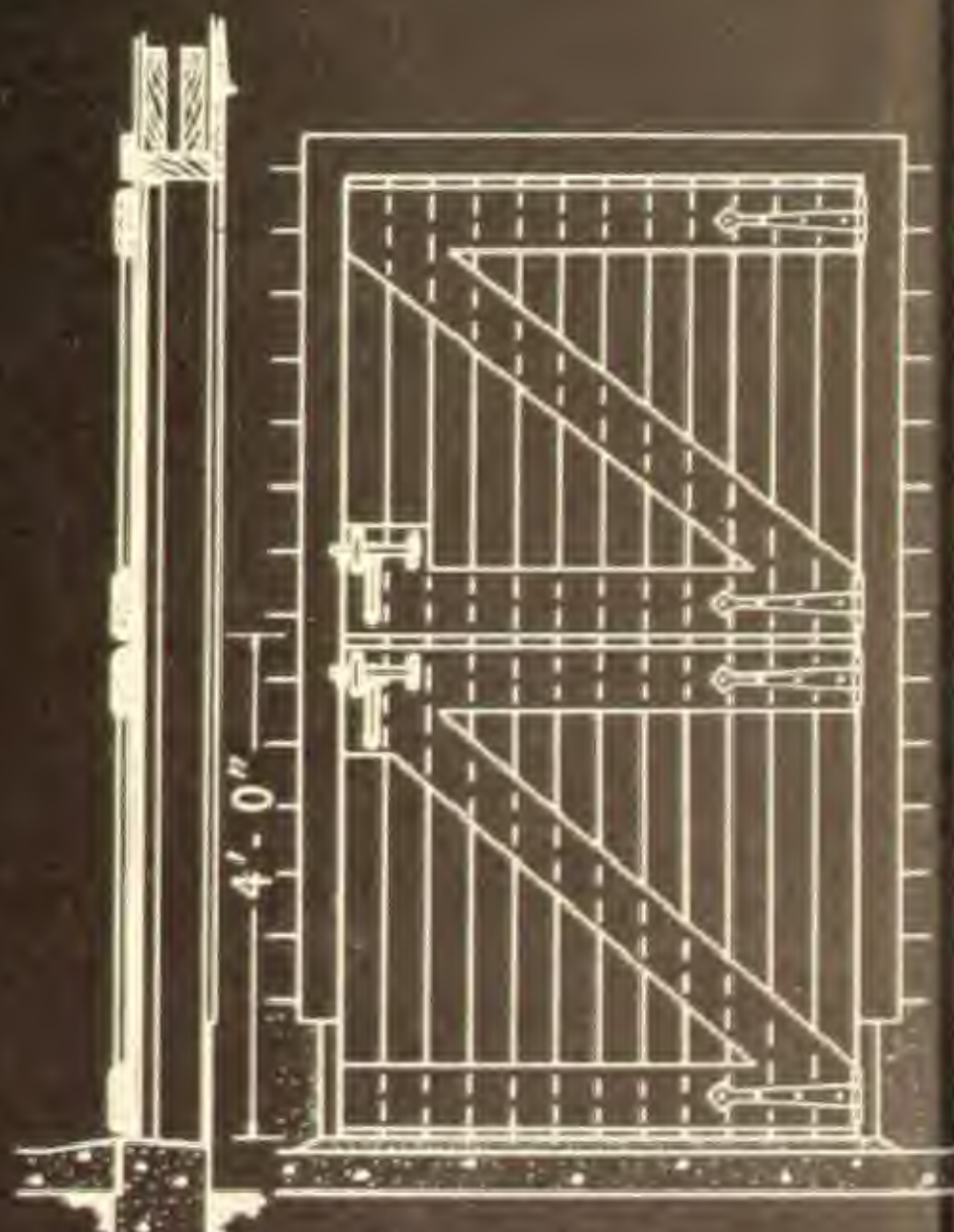


Doors may be batten type or faced mortise and tenon

BARN AND STABLE DOORS



Faced Mortise and Tenon Stable Door
Stiles and rails of 2" material.



Batten Type Stable Door
Battens of 1 1/8" material.

BARN AND STABLE

D O O R S

Most farmers use plain batten doors for their barns and stables. Batten doors, made from good lumber $1\frac{1}{8}$ in. thick, well braced, with substantial hinges and latches, provide sturdy, serviceable doors at moderate cost. The smooth outer surface of batten doors sheds the rain and doors can be made right on the job. For this reason, batten doors are most commonly used. Barn doors can be in one or two sections and stable doors halved, Dutch type, as required.

Faced mortice and tenon doors, with or without sash for glass, are also used for barns and stables, especially when better appearance is desired. Some of the barns illustrated in this book have faced mortice and tenon doors. Both types are illustrated on the opposite page.

Use Barn Door Track Where Practicable

Doors hung on barn door track, with roller bearing hangers packed in grease, are easily opened and rolled back, no matter how strong the wind. Roller doors, unlike hinged doors will not slam open or shut in the wind, break hinges and damage walls. Roller doors are not easily blocked by snow and there are no wide paths to dig or chop through ice and snow when the doors are hung on Beatty roller door track.

Tube barn door track is best for heavy doors and outside use. The door hangers run inside the tube track. Track ends are closed to prevent dirt, snow, ice or birds nests from jamming the wheels of the hangers. Flat door track is suitable for light, inside granary, feed and root room doors.

Gable End Barn Doors

Tube barn door track provides the simplest, safest and most practical method of hanging gable-end barn doors. The pulleys and cable, supplied for counter weights, allow the doors to be so balanced that a few pounds of lift will quickly bring them up to place.

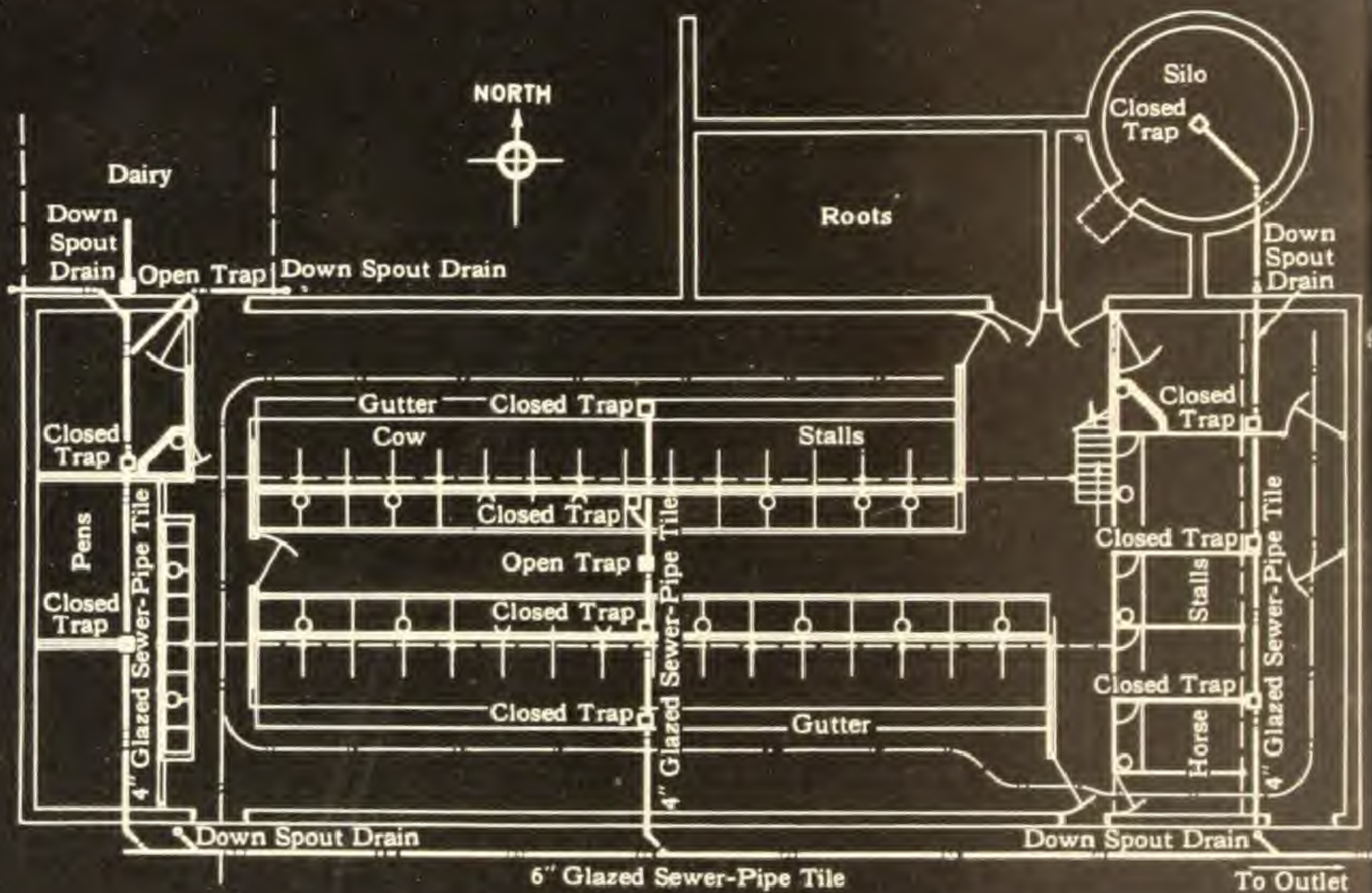
Measurements given in the table on page 113 represent the size of the finished door and not the opening for the frame. Roller doors should be two inches wider on each side and two inches higher than the door opening.

Stable Drainage

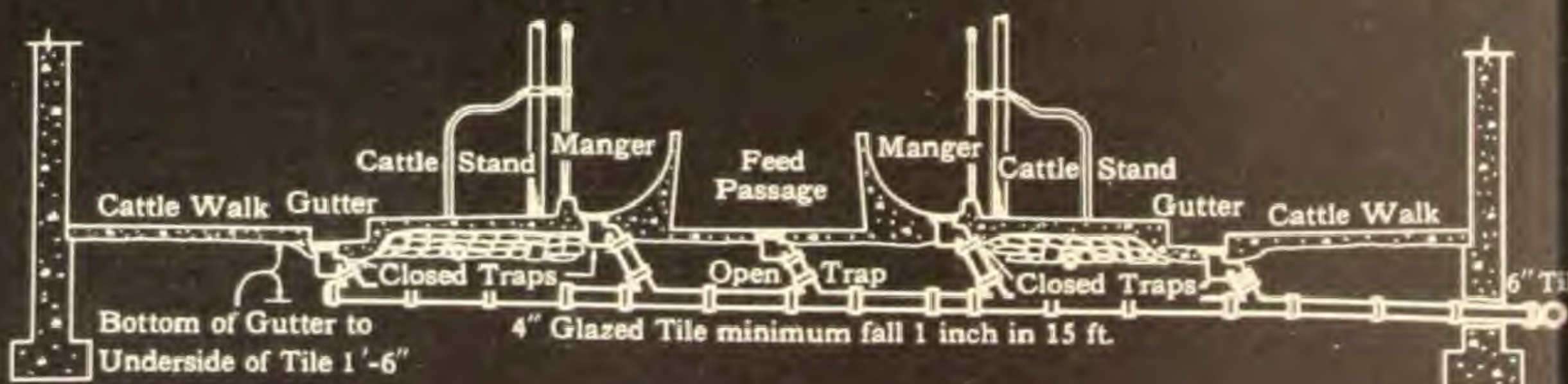
Drainage from stable floors and gutters is a matter of preference. Some stockmen claim drainage is not necessary and prefer to save the cost of traps, tile and labor digging drains. Mangers are cleaned by hand. Liquid manure is saved by shovelling it with the bedding into a manure carrier. It is then deposited on top of a pile in the yard, into a covered manure shed or hauled directly from the stable to the field. Stables without drainage depend on lime or commercial disinfectant sprinkled on the floors and gutters to neutralize stable odors and control disease germs.

Gutter Drainage

Drainage from gutters may be continuous through open traps which keep the gutters dry but waste the valuable liquid manure. The liquid manure can be saved by installing drain tile below the frost line and draining the liquid into a sump or tank located well below the surface of the ground. The liquid is then pumped into a tank wagon or over a load of manure and spread on the land. Conserving liquid manure by draining into a sump,



**STABLE FLOOR PLAN SHOWING LOCATION
OF TRAPS AND STABLE DRAIN TILE**



**CROSS SECTION SHOWING INSTALLATION
OF TRAPS AND TILE DRAINS**

eliminates washing the stable with water. The water would also drain into the liquid tank and would have to be pumped and spread over the land. This is a costly method for disposing of water. If stables are washed, provision should be made for washing water to be diverted away from the storage tank to avoid handling the extra water.

Washing Mangers, Gutters and Walks

Some farmers are installing drainage for washing their stables only, when a thorough cleaning with water is necessary. Gutter traps with closed covers are installed so the liquid manure cannot escape through the traps. The liquid manure is saved and handled exactly the same as from stables without drainage, referred to above. The closed cover on the gutter trap cuts the drain off until the cover is removed for washing the stable with water. This system saves the valuable liquid manure with a minimum of handling and the whole stable can be thoroughly washed with water when washing is necessary. Eaves-trough down spouts and foundation drains can be connected into this system. The waste water is carried a short distance from the stable and allowed to drain off into the ground. With this system, the drain tile can be installed just below the stable floor. It is not necessary to go below the frost.

Slope Floors for Drainage

Curbs, manger fronts and stable equipment should be put in level. So far as lengthwise arrangement is concerned, walks, cattle stands, mangers, feed alleys and passages will be level, except for slight slopes to gutters and drainage traps. Feed alleys, manger bottoms and gutters should have a lengthwise slope towards the drain traps of two to three inches in 50 feet. When the feed alleys, mangers and gutters are longer than 50 feet, traps can be placed in the centre and the alleys, manger bottoms and gutters made to slope from both ends towards the trap. When the drainage area is longer than 50 feet, use two traps and slope both ways toward each trap. Cattle walks and stands slope towards the gutters. Pens and box stall floors should slope $1\frac{1}{2}$ inches toward the traps. Two box stalls can drain into one trap, under the partition between the stalls. Cattle, calf and box stall mangers can be kept clean, sanitary and healthy if provision is made for occasionally flushing them out with water.

Size of Tile

Traps should be installed level and one-half inch below the lowest point in the floors, gutters and mangers so the water will drain into them. Glazed tile is recommended for stable drains. Size 4-inch will accommodate the water from washing the stable and from one eaves-trough down spout. It is best to use 6-inch tile outside the barn, especially when the water from the entire roof must be carried off through the drain. Tile should have a fall towards the outlet of not less than one inch in 15 feet. The outlet can be open ground, cesspool or tank for conserving liquid manure, depending on the type of drainage, method of handling the liquid, and the level of the ground around the buildings.

Save Liquid Manure

Farm manure is undoubtedly the most efficient, complete and economical of all fertilizers. When it is borne in mind that 75 per cent of the fertility of the manure is contained in the liquid, the

STABLE

D R A I N A G E

Four attractive barns
at Grove Farm, property
of Col. H. Cockshutt,
Brantford, Ont. Beatty
equipment used in all
four.



Four substantial
barns of Mr.
Harry W. Stewart
and Sons, St.
Catharines, Ont.
Remodelled and
Beatty equip-
ped.

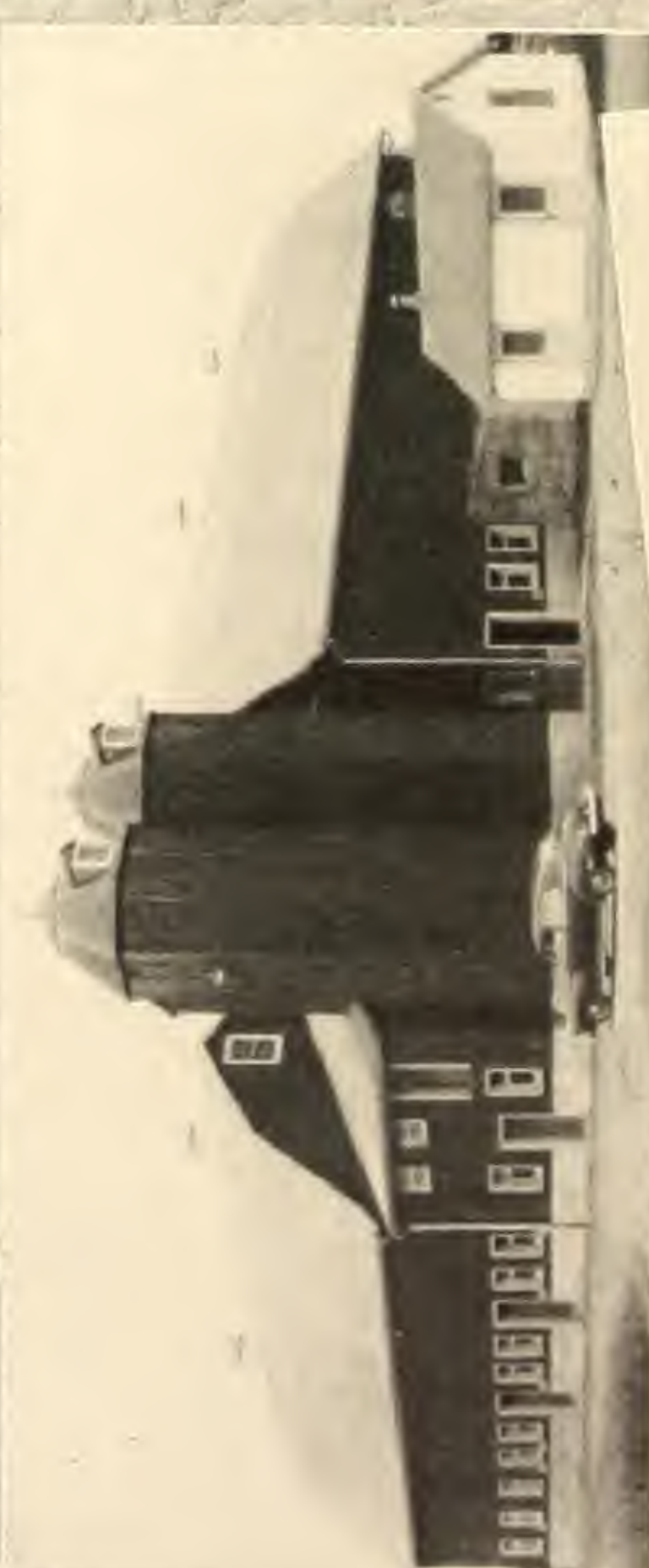


MORE

**G
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S**



Six fine barns at Maryvale Farms, Estate of the late Sen. F. P. O'Connor, Agincourt, Ont. Beatty equipped throughout.



Don Head Farms, Richmond Hill, Ont.

She breeds Canadian pure-bred herds, 200 Jerseys and 150 Aberdeen Angus cattle. Four of the farms have



Beath Farms, Oshawa, Ont.

Six modern L type barns, housing a large Canadian pure-bred Shorthorn herd. Beatty Steel Stable equipment extensively used in all six barns and installed over a period of years.

Stevenson Farms, Alliston, Ont., showing beef, horse, dairy and hog barns, remodelled, built and Beatty equipped throughout by the late Mr. T. P. Loblaw, now owned and operated by Mr. W. J. Wood, Alliston, Ont.



Country home of Mr. K. Wills, Calgary, Alta.



Colpitts Ranches, Calgary, Alta.

300 Beatty sanitary, labour-saving steel cow stalls in the barns above help to produce clean, wholesome milk for the city of Calgary.



Three dairy barns built and Beatty equipped by City Dairy Farms Limited, Toronto, Ont. One of the earliest producers of certified milk. These barns housed 300 dairy cows tied in Beatty sanitary steel cow stalls.

importance of conserving the liquid and using it to the best advantage becomes very evident. A manure shed provides one of the best means of caring for stable manure. The liquid in the cistern of the manure shed can be pumped up from time to time and sprinkled over the solid manure in the shed to prevent it from heating. Traps used should have screens below the cover to prevent straw and litter from being washed into the drain.

Further information on stable drainage, gutter, manger and bell traps will be sent upon request. Manure sheds are shown on page 92.

Stable Floors

Stable floors should be easy to clean, sanitary, comfortable for animals, durable and inexpensive. No other material meets these requirements as well as concrete. Old-style, germ-infested, insanitary wood floors are rapidly becoming a thing of the past.

The question is sometimes asked, "Are concrete floors liable to be damp and cold?" The answer is that concrete stable floors are not damp or cold when the cattle stands and box stalls are properly underdrained as shown on page 126. All the fine barns illustrated in this book have concrete floors.

Good drainage is one of the first essentials of floor construction. If the barn is in a low place, a filling should be made so that the stable floor will be six or eight inches above the surrounding ground. If the location is on heavy clay soil, a layer of loose stone or cinders should be placed between the clay and the concrete floor. Where there is a possibility of excessive moisture under the stable floor, it is advisable to place tile drains under the cattle stands and floors of pens to keep moisture from contacting the underside of the concrete floor. Four-inch tile should be used.

It pays to make sure the area under the floor where the cows lie down is dry. Dry floors will be warm and comfortable and mean much to health, protection and comfort. See page 126 and drainage plan on page 116.

Concrete stable floors should have a uniform thickness of three to four inches, of which one inch should be a finished coat of cement mortar.

Creosote Block, Cork Brick and Mastic

Wood blocks treated with creosote or cork bricks are sometimes used in making the floors of cattle stands, pens, horse tie-up and box stalls. They should be laid on a concrete foundation and the cracks between the bricks or blocks filled with a heavy coating of tar pitch or neat cement. Mastic poured into a concrete foundation also has been used for horse tie-up and box stall floors. These make less durable and somewhat expensive floors but are satisfactory if well laid. The advantage claimed for them is greater warmth and cushion for the animals' feet.

Concrete Proportions

The proportions of cement, sand and gravel to mix for concrete foundations and walls are 1:3:6; that is to say, one part cement to three parts of sand and six parts of gravel. For floors, a 1:2:4 mixture should be used. Unless pit-run gravel has the right proportions of sand and gravel, it should be screened and properly proportioned by adding sharp sand or fine stone, whichever is required.

STABLE

F L O O R S

Three large barns of Mr. Norman Watson and Sons, St. Thomas, Ont. All three are Beatty equipped.



Barns at Bannockburn remodelled and built by Mr. Mitchell F. Hepburn, St. Thomas, Ont. Beatty labour-saving steel stable equipment is extensively used here.

The amount of concrete in a stable floor is found by multiplying the length in feet by the width in feet by half a foot. The half foot represents the thickness of the concrete. Floors are only three to four inches thick, but two inches must be added to allow for the extra material in mangers and curbs.

A barn measuring 34 x 60 ft. inside the walls, would have 1020 cubic feet of concrete.

To find barrels of cement, multiply by .048.

To find cu. yards of sand, multiply by .0155.

To find cu. yards of gravel, multiply by .031.

1020 x .048 equals practically 49 bbls. cement.

1020 x .0155 equals 15.81 cu. yards sand.

1020 x .031 equals 31.62 cu. yds. gravel.

The walls may be estimated in the same way. Using a 1:3:6 mixture in the walls, multiply by .033 for barrels of cement, .016 for cu. yards of sand and .032 for cu. yards of gravel. A rule for figuring the approximate amount of cement is as follows:—1-1/3 barrels of cement for a cubic yard of concrete floor and one barrel of cement for a cubic yard of concrete wall. There are 27 cubic feet to a cubic yard and four bags to one barrel of cement. Note: Door and window openings, should be deducted when calculating cubic yards of concrete in walls.

Table of Cattle Stand Measurements

Breed	Width of Stall	Length of Cattle Stand		
		Small	Medium	Large
Mature Holstein	3' 6" to 4'	4' 7"	4' 10"	5' 4"
" Shorthorn	3' 6" to 4'	4' 7"	4' 10"	5' 2"
" Hereford	3' 6" to 4'	4' 6"	4' 9"	5'
" Ayrshire	3' 6" to 3' 10"	4' 5"	4' 8"	5'
" Angus	3' 6" to 3' 10"	4' 5"	4' 8"	4' 10"
" Guernsey	3' 6" to 3' 10"	4' 5"	4' 8"	4' 10"
" Jersey	3' 4" to 3' 8"	4' 2"	4' 5"	4' 8"
Young Stock	3' 0" to 3' 4"	3' 8"	4'	4' 2"

If cattle are to be kept clean and have maximum comfort and protection, care should be exercised in making cattle stands right length and width to suit the size and breed. In arriving at measurements for cross section plans in this book, the average stall, which is 3' 8" wide by 4' 10" long, has been shown. Stockmen should not be influenced by the size of stalls shown in cross sections in this book but by the size of cattle in their own herd and by the table of measurements above. When ordering plans, breeds as well as size of cattle should be stated.

Pens for Bulls: 10 ft. x 14 ft. Not smaller than 10 ft. x 10 ft.

Pens for Cows: 10 ft. x 13 ft. Not smaller than 8 ft. x 10 ft.

Pens for Hogs: 10 ft. or 12 ft. wide and 12 ft. deep each to accommodate 8 to 11 hogs.

Stalls for Horses: 5 ft. to 5 ft. 6 in. x 9 ft.

Box Stalls for Horses: 12 ft. x 13 ft. Not smaller than 9 ft. x 12 ft.

Pens, Individual for Calves: 5 ft. x 5 ft. Not smaller than 3 ft. 6 in. x 4 ft. 8 in.

Location of Horse Stalls

Horses may be stabled with beef cattle or dairy cows. When horses are kept in the same stable as dairy cows, some dairy inspectors advise a tight partition between horses and cows to prevent odors from the horses getting into the dairy stable. Other inspectors allow the horses to be kept in the same stable as the cows, without a tight partition between, providing the equipment is sanitary and the stables are kept clean. When horses are stabled with cattle, it is preferable to place them in the North or East end of the stable, saving the sunny South and West for the cattle. Horses and cattle housed in the same stable reduce

STABLE WIDTH
30'
32'
34'
36'
38'

GIRDER CENTERS	CATTLE WALK	GUTTER	STAND AND MANGER	FEED ALLEY	COLUMN CENTERS FROM H.R.
10' 10'	5'	1'6"	8'1"	2'5"	4'1"
10' 12'	6'	1'6"	8'1"	2'11"	3'7"
11'6" 11'6"	6'6"	1'6"	8'1"	3'8"	4'4"
12' 12'	6'6"	2'	8'1"	3'10"	4'4"
12' 12' 14'	7'6"	2'	8'1"	4'10"	3'4"

WALL THICKNESS
6"
6"
6"
10"
10"



STABLE WIDTH
32'
34'
36'
38'
40'

GIRDER CENTERS	CATTLE WALK	GUTTER	STAND AND MANGER	FEED ALLEY	COLUMN CENTERS FROM H.R.
10'6" 10'6" 11"	4'2"	1'6"	8'1"	3'6"	9"
11'3" 11'3" 11'6"	4'11"	1'6"	8'1"	4'	9"
12' 12'	4'10"	2'	8'1"	4'6"	9"
13' 13' 12'	5'10"	2'	8'1"	4'6"	9"
13'6" 13'6" 13'	6'2"	2'	8'1"	5'6"	9"

WALL THICKNESS
6"
6"
10"
10"
12"



MEASUREMENTS OF CATTLE STABLES SHOWING STANDARD JOIST LENGTHS AND BEST COLUMN LOCATIONS FOR STABLES 30 FT. TO 40 FT. WIDE OUTSIDE.

building costs and save time and labor in caring for them. Separate dairy and horse stables are best when circumstances permit such an arrangement.

Location of Cattle and Calf Pens

Bull, cow, young stock and calf pens may be arranged where convenient in the dairy or beef stable. Bull pens should be located away from the main entrance to the stable so that visitors will not pass the bulls when entering or leaving the stable. Cows on test, about to freshen or sick, should be in a place where they will not be disturbed. Young stock pens can be placed where most convenient. Calves thrive best in a bright, warm location. If possible, bulls should have an exercising yard with a door leading directly into it from the bull pens.

Cattle Walks and Feed Alleys

Cattle walks and feed alleys vary in width according to the width of the barn. Recommended widths for walks and alleys in stables of different dimensions where cattle face the centre and where they face the outer walls are given in detail on page 126. The widths are based on using standard lengths of joist and placing supporting columns in the most convenient position which is on the cattle stand. When cows face in, the most convenient position for the columns is nine inches from the center of the column to the center of the headrail. When cows face out, the most convenient position for the columns is on the cattle stand just beyond the gutter.

When cows face in, feed alleys are in the center of the stable. They are crowned one inch and slope to the manger on either side, unless drainage is used. When drainage is used, the feed alleys slope to the center and to the traps. When cows face out, the feed alleys are along the wall on both sides; the slope for drainage is from the wall to the manger or to the traps, a fall of one inch. See information on slopes for drainage, page 116.

When cows face in, the cattle walks are next to the wall and slope one inch from the wall to the gutter. When cows face out, the cattle walks are in the center and are crowned one inch in the center, sloping both ways to the gutter.

Cattle walks and feed alleys should be given a rough finish by using a wood float to prevent cattle and those attending them from slipping. Cross alleys should slope to the gutters.

Curbs

Concrete Curbs for cow stalls should be six inches wide and six inches high on the cattle stand side and five inches high on the manger side, built in one long, level piece. The face of the curb on the cattle stand side should be cut out $1\frac{3}{4}$ inches at the top and the full length of the row of stalls. They should taper downward and outward to the face of the curb at the bottom. The cut-away should be five inches deep and extend downward within one inch of the cattle stand. The cut-away curb face can be made by a triangular piece of wood properly shaped and nailed to the inside of the curb cribbing before the concrete is poured. Cow stall curbs should always have a **cut-away face**. All edges should be well rounded and all corners should be well sloped to eliminate any sharp surfaces. Well rounded cut-away curbs will reduce the possibility of accidents, big knees and bruised briskets. This type of cut-away curb face may be used only when installing Beatty steel cow stalls.

Curbs around Beatty pens should be six inches wide, two feet high for calf and hog pens, 2 ft. 6 in. high for cow, young stock and bull pens, except at the gates where the curbs are seven inches high. Pen curbs should be tapered and well rounded on both sides at the top. They should be $1\frac{3}{4}$ inches less than the six inches on both sides at the top running out to the face at seven inches below the top of the curbs. Be sure the concrete mixture for the curbs is strong and made from clean, sharp, screened gravel. The proportion for the curbs should be a 1 to 4 mixture using a fine gravel.

Gutters

Eighteen inches to 24 inches is the recommended width for gutters. The depth should be seven inches on the cattle stand side, four inches on the cattle walk side, and sloping one half to three quarter inches towards the cattle walk. Slope the bottom of the gutters lengthwise as required to drain. See plans below.

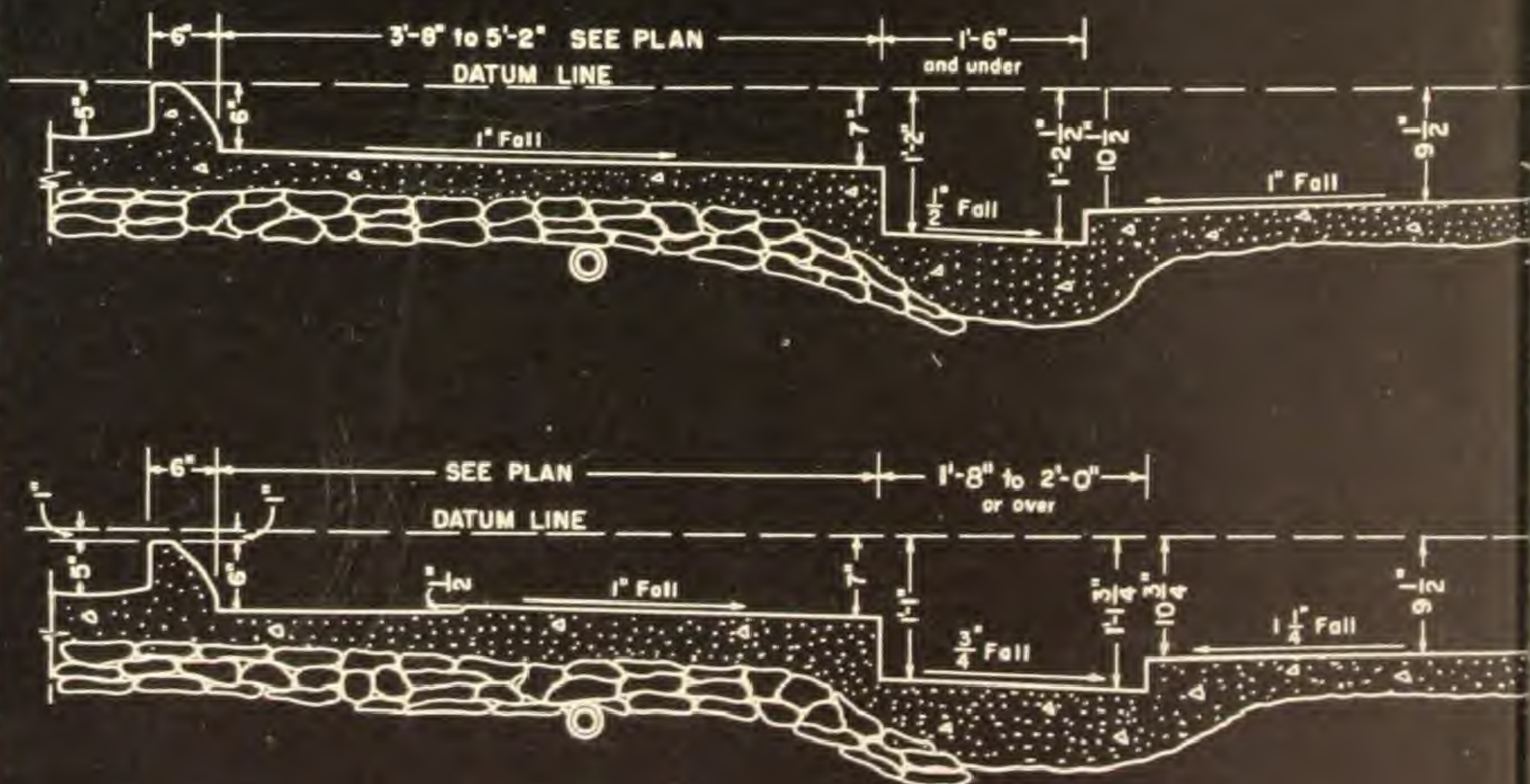
Mangers

Mangers for cattle standing stalls should be carefully considered and the most satisfactory type adopted and built. Of the types used, managers with high concrete fronts, gradually rounding at the bottom towards the animals, are now considered by most dairymen, breeders, feeders and mixed farmers to be the best.

Low managers without fronts, eight inches deep, the tops of which are even with the floor of an elevated feed alley, allow the animals to nose part of their feed out of the managers into the feed alley so that after eating what is left in their managers, they get down on their knees, pushing and straining to get at the feed nosed out of reach on the feed alley floor. They also push and strain to right and left along the manger bottom, robbing what feed they can from their neighbors. Pushing and straining on their knees, trying to get at feed that has been nosed out of reach, because of improperly built managers, is the chief cause of enlarged knees, bruised briskets, winged shoulders and often more serious accidents.

Concrete managers with high fronts are built to curve downward and inward on the inside so that feed works down towards the animals as they eat out of the managers. Any feed accidentally spilled out drops behind the high manger front where the animals cannot see it and will not reach for it. Managers with high fronts eliminate reaching and straining and there is no need for the animals to get down on their knees. The feed is in the bottom of the high front manger, close to them and directly under their noses.

Managers with high fronts and rounded bottoms have no corners in which feed can collect and sour. They are easy to clean and keep clean.



TYPES OF CATTLE STALL GUTTERS

The dimensions for building mangers with high concrete fronts are: Height 2 ft. 6 in. above feed passage floor. Inside width 2 ft. 6 in. from face of curb or 2 ft. 9 in. from center of stall post at top of manger. The bottom of the manger should be one inch above the cattle stand. Note that the passage side of the manger is not perpendicular but slopes backward at the bottom three inches from the perpendicular. This saves concrete and enables the worker to stand close to the manger front when feeding stock.

Manger divisions of concrete or steel are recommended for use with high front mangers to prevent reaching and straining along the bottom of the manger and to prevent greedy cows robbing their neighbors. Illustrations of steel manger divisions show them furnished with spacer rails which prevent animals from tossing feed out into the feed alley. If steel divisions are not used, Feed Rails, Fig. 742, should be used to help keep hay in the mangers.

When built exactly according to measurements, dimensions, plans and templet, and when combined with either concrete or steel lifting manger divisions, concrete mangers with high fronts are ideal. They eliminate all reaching for feed and remove the chief cause of enlarged knees, bruised briskets and winged shoulders. Steel lifting manger divisions can be installed with the equipment or installed later if desired.

Mangers with high concrete fronts are used in practically every stable shown in this book. Many have steel lifting manger divisions which is an indication of their popularity and the satisfactory service they are giving. Mangers are important. They have a bearing on the welfare of animals and for that reason, the best type should be carefully considered and properly built.

Cattle Stands

The cattle stand should have one inch fall to the gutter. The length of cattle stand and width of stall vary according to the breed of stock and size of the animals. See table of measurements on page 125. If animals are to be kept clean and, at the same time, given the maximum comfort and protection, it is very important that stalls be made the right size, according to breed and size of animals.

Experience shows that stalls too narrow and cattle stands too short are as detrimental to comfort, cleanliness and protection as are stalls too wide or too long. Suitable lengths and widths of stalls has become so important to dairymen and breeders that each herd should be considered individually before making the plan of stable floors. The same applies to cow pens and box stalls for horses.

More and more farmers are insisting on well proportioned and constructed cattle stands, curbs, gutters and mangers. Experience shows the advantages of having these details exact in all respects.

The maximum of comfort, cleanliness, protection and general efficiency of cows, which result in better profits, are so closely tied up with exact details of cattle stands, curbs, mangers and other parts of stable floors that it is not reasonable to guess or roughly calculate these dimensions. They should be as accurate as possible.

Details of stable floors are so important that it is profitable for milk producers and breeders considering building or remodelling barns and stables, to ask for the help of a Beatty representative to plan and lay them out. Knowledge of general stable construction and wide experience in helping customers with exact dimensions for cattle stands, curbs, mangers and stalls to suit their herds, makes the Beatty representative a valuable consultant. This service is given without any obligation. Drawings showing measurements in detail for the correct building of stable floors, gutters, cattle stands, curbs and mangers will be sent to customers on request. Write for further details.

Two well proportioned barns at Hawthorne Farms, owned and operated by Mr. Walter E. Calvert, Brampton, Ont. Beatty steel stable equipment is used every day in both barns.



Four very large barns at Ringwood, property of Mr. Geo. Rodanz, Stouffville, Ont. Beatty equipped throughout for purebred Hereford cattle.





Three very modern dairy barns built and completely Beatty equipped by Messrs. Chas. E. and M. O. Binkley, Waterdown, Ontario.



Two equally modern beef feeding barns built and completely Beatty equipped by Mr. Percy McKee, Paquette, Ont.





Four barns at Roselawn Farms,
Estate of the late Mr. E. T.
Stephens, Richmond Hill, Ont.

All four have Beatty steel
labour-saving equipment and
house over 300 Jerseys.



Two New Brunswick dairy barns of Mr. Garth Marr and Sons, Corn Hill, N.B. The first barn was built by Mr. Marr's grandfather, one of the earliest in New Brunswick to use Beatty steel stable equipment. The second barn built by Mr. Marr also has a complete installation of Beatty labour-saving sanitary steel stable equipment.

r Norfolk coun-
 dairy barns at
 thallan Farms,
 te of the late
 H. A. Swart,
 coe, Ont. All
 barns Beatty
 pped through-



Extensive layout of Mr. W. L. Parrish, Winnipeg, Man., stabling over 200 dairy
 cows. All three barns are Beatty equipped.



Heads out—centralizes
milking and cleaning.



Heads in—saves time
and labour in feeding.

THREE BEATTY EQUIPPED STABLES
PRODUCING TOP QUALITY MILK

The Layout of the Stable

The general practice in new or remodelled stables is to arrange the cattle standing stalls in long rows lengthwise of the building. Placing the cattle in long rows allows centralized feed and litter alleys. Long centralized feed and litter alleys save labor and speed up the work of feeding, cleaning, milking and caring for the stock.

One question that must be decided before the final stable plan is complete, is whether the animals will face in towards the center of the stable, or face out towards the outside stable wall. Points for both methods are listed below:

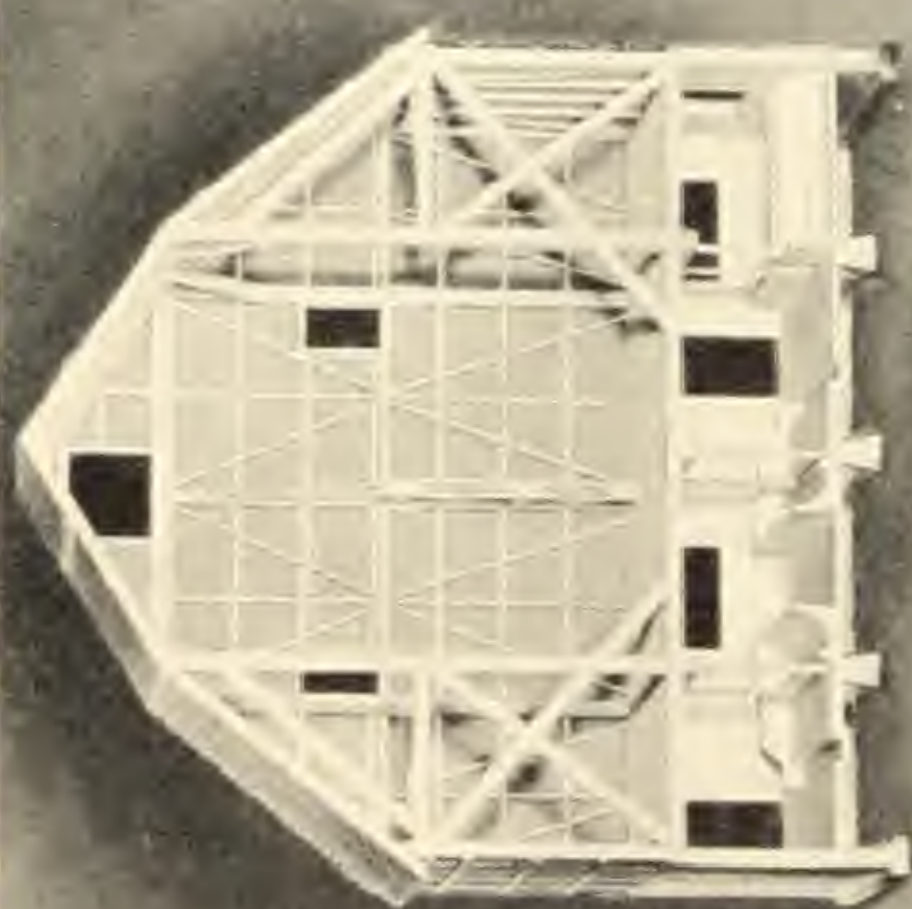
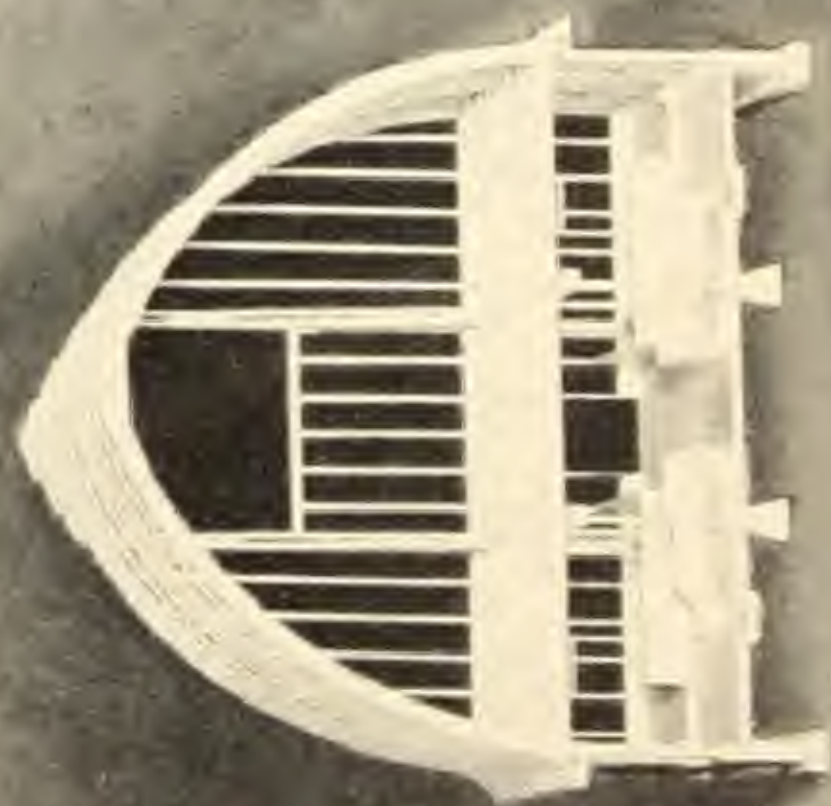
Face In—

1. Sunlight falls on the back and udder of cows that face in, providing better light on the business end where most needed for milking.
2. When cows stand backs to windows, the milker can quickly see whether or not the flanks and udders are healthy and clean.
3. Milk pails and containers can be placed close to the outer stable wall, well back from the cows and away from splash from the gutter.
4. Barn supporting posts are at the animal's shoulder well out of the way of milking operations.
5. Supporting posts are close to the headrail at the narrowest part of the cattle and do not interfere with or take up room the animals need when lying down.
6. Facing a central feed passage, both rows of animals can be fed at one trip from a more centrally located feed room. This saves both time and labor. Whether the animals face in or out, each gutter must be cleaned separately so no time is saved in cleaning by having the animals face out.
7. Gravity ventilating systems work better when cattle face in. The outlet flue can be placed directly above their heads for removal of stale air.
8. A face-in stable, has two cattle walks, one on each side. Half the animals use each walk. This, compared to a face-out stable, with one central cattle-walk used by all the animals, means less confusion, less crowding, less bullying, few accidents and less possibility of animals getting into the wrong stall when going out of or into the stable.
9. Cattle tied in stanchions are tied and untied by the operator walking along the feed passage. When animals face a central feed passage, the operator walks less and so saves time.
10. Animals for purchase, are judged mainly from behind. When they face in, the light is behind the purchaser and on the important end of the cattle.
11. Animals facing out into strong sunlight are not as comfortable as animals facing in.
12. Sunlight on the gutter kills disease germs.

Face Out:—

1. Cattle walks should be centralized rather than feed alleys. Three-fourths of work such as cleaning and milking is done behind the cows.
2. Cows facing out cannot breathe into each other's faces.
3. Herd does not have to be divided when coming into the stable.
4. The entire herd can be seen at one time from a central cattle walk.
5. Advocates of face out, say that when animals face in, the manure from the gutter spatters stable walls.
6. One central litter alley and two feed alleys take up less room than two litter alleys and one feed alley. Stables with animals facing out can be slightly narrower.

WHY NOT TAKE ADVANTAGE OF BEATTY BARN PLAN SERVICE
AND BUILD OR REMODEL BETTER AT LESS COST?



Beatty Barn Plan Service

To anyone thinking of building or remodeling, we suggest that a careful study of this book should be helpful and profitable, showing as it does what has been accomplished by so many successful farmers and stockmen. Write us giving the size of your barn, number of livestock to be housed, etc., or send us a floor plan or sketch showing the arrangement of your stable. We will be glad to go over this carefully and suggest any changes that seem desirable.

A ground floor plan of your stable will be made for you, free of charge, that will be drawn to scale and will show every stall, passage way and supporting column in its right place and with all measurements clearly shown. Feel perfectly free to ask any question you wish about barn construction. This service, from men experienced in barn building, is maintained to assist you and has saved farmers a great deal of money.

Beatty men have made a special study of reclaiming old barns by rebuilding. Every year hundreds of farmers are helped to make over old barns into buildings as good as new, at a fraction of the cost of new barns of equal capacity. Best results, at least expense, depend on doing it while walls and timbers are reasonably sound. Farmers are urged to reclaim the old barn before it is too late.

Reclaiming an old barn to make a sound, modern building, has a three-fold value. It is as profitable a job of conservation as saving forests or soil. **First**—it stops the rapid depreciation and waste of the old barn and saves its complete replacement later at considerably greater cost and provides a barn as good as new. **Second**—It provides a pleasant, handy, modern, well-planned, time and labor-saving stable in which to care for stock. **Third**—It makes a stable as good as new where a herd will be healthier, cleaner, more comfortable, will show to advantage and in which costly accidents may be avoided.

Increased production and increased earnings and profits from a herd will result from a moderate outlay if a barn and stable are reclaimed in time.

Complete Plans and Specifications

A complete set of barn building plans, including ground floor, details of foundations, walls, and framing, lumber bill, specifications for concrete and other materials covering a specified barn, will be furnished at slight cost. These complete plans and specifications are ready to hand to a builder or contractor for a quotation on the work. They will be drawn, printed and mailed to anyone requesting them.

BARN

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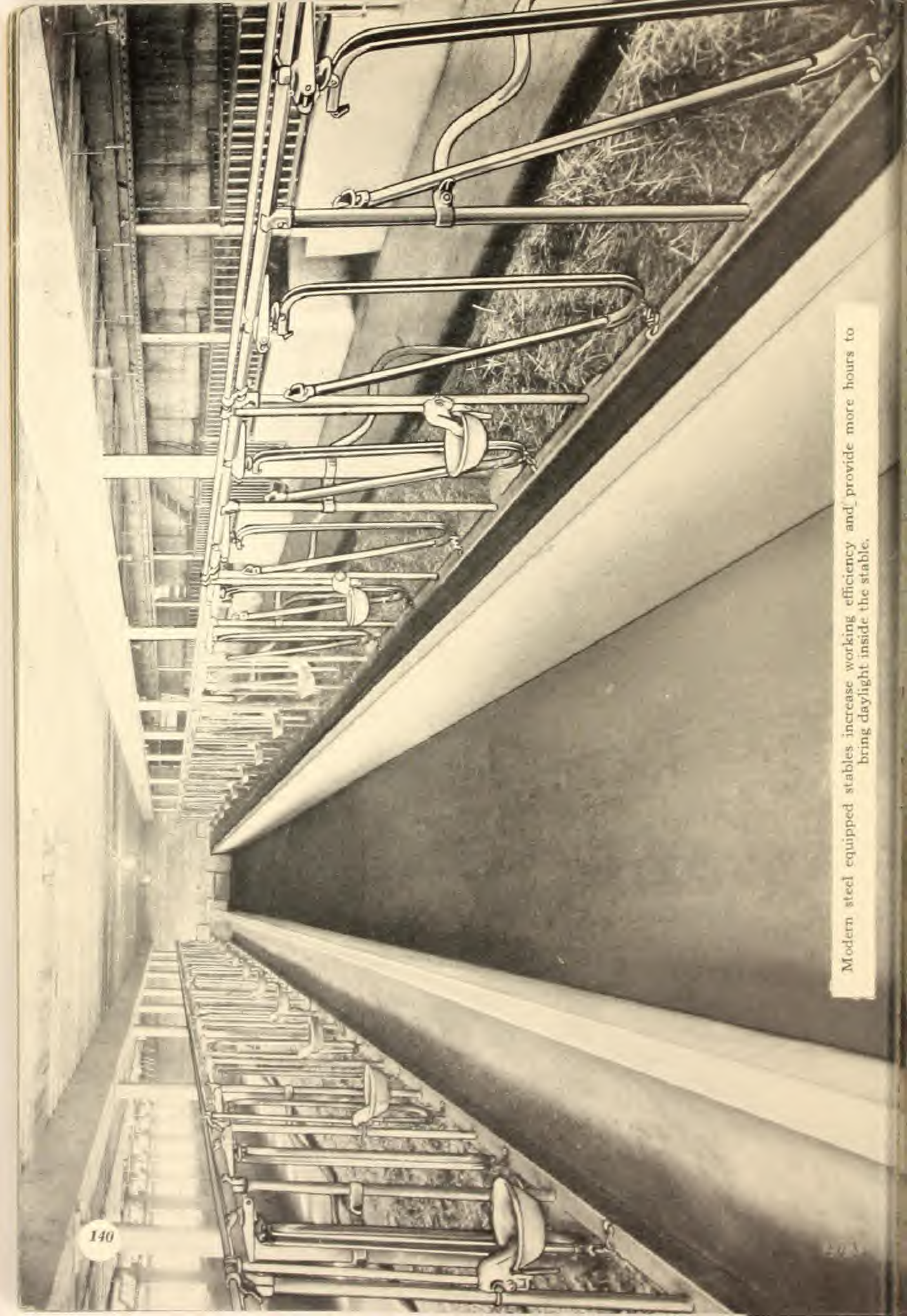


Tied in Beauty Sanitary Steel Stalls. Clean, Comfortable and Contented.



Beatty steel stalls and stanchions, well installed, save hours of labour keeping flanks and udders clean. Note the long rows of clean cows here shown, aligned evenly to the gutter.





Modern steel equipped stables increase working efficiency and provide more hours to bring daylight inside the stable.



**BEATTY SANITARY STEEL PENS
BRIGHT, AIRY AND INEXPENSIVE**

Write the Beatty branch nearest you for information on other
Beatty labor savers listed here.

Beatty Products are the Finest Made

Brooder Stoves.
Bull Staffs.
Barn and Garage Door Track and Hangers.
Can Conveyors.
Feed Carriers.
Fresh Air Inlet.
Floor Polishers and Waxers.
Furnaces.
Hay Carrier Outfits.
Hog Waterers.
Horse Stable Fittings.
Irrigation Systems, garden and orchard.
Ironers, electric.
Jacks, Pump.
Jacket Heaters.
Ladders, step, extension, platform step, shelf,
painters', fire, electricians', mechanics', fruit
picking ladder, trestles, and extension
planks, safety ladder feet, painters' paste
table, ladder brackets.
Laundry Equipment, tub benches, tubs, tub
drainers and hose, clothes racks, ceiling
driers, ironing tables.
Line Shafting and Pulleys.
Manure Carriers.

Monorail Conveyor Systems.
Pens and Mangers, for bulls, cows, calves,
steers, hogs.
Pulleys.
Pumps, for wells, cistern, electric and engine
drive, windmill drive.
Pump Fittings, cylinders, pump rod coup-
plings, leathers.
Ranges, Coal, Wood, Electric.
Power Hoists.
Steel Cow Stalls and Stanchions.
Sump Pumps.
Silo Irons and Rods.
Trucks, floor, feed, warehouse, factory.
Ventilators and Traps.
Washers, hand, electric, engine drive.
Wringer Rolls.
Water Bowls for livestock.
Water Heaters, automatic electric.
Water Pressure Systems, electric, engine
drive, windmill drive.
Windmills.
Wire Stretchers.

Beatty Products are Backed by Beatty Service

Beatty Bros. Limited serve the world. Beatty products are used in nearly every city, town, hamlet, and on nearly every farm in Canada. Beatty products are used in more than 50 countries throughout the world. Six Beatty factories, six Beatty branches and over 10,000 Beatty dealers are ready to serve you.

The firm's responsibility does not end with the delivery of the product; they see to it that service, whenever needed is quickly available. Customer satisfaction has been the best advertisement for the Beatty industry. Beatty users know that it pays to choose Beatty not only because of the outstanding quality but also because of the reliable service given by the product and by the Beatty branch and dealer organization.

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Here is shown the main factory of Beatty Bros. Limited, largest plant of its kind in Canada making barn and stable equipment, washers and pumps. One of six Beatty factories which have a floor space of 18.8 ac.



Beatty Barn and Stable Equipment Books



<u>No.</u>	<u>Title of Book</u>
1	Barn Building Section.
2	Sanitary Steel Cow Stalls and Supporting Columns. Sanitary Steel Pens for Livestock.
3	Water Bowls, Tanks, Pumps, Windmills.
4	Sanitary Steel Horse Stall Fittings.
5	Manure Carriers, Feed Carriers, Milk Can Conveyors.
6	Hay and Grain Carriers.
7	Barn Door Track and Hangers.

Beatty